Model CX-2000 Program-a-Strip®
Programmable Coaxial Cable Stripper
Specification 2.17
Owner's Manual

Specifications are subject to change without notice.

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Orbital™
Technologies, Inc.

Thank you for choosing Orbital Technologies, Inc. for your cable processing needs. Our goal is to provide our customers with accurate, reliable, state-of-the-art wire processing equipment and services at reasonable cost. All Orbital equipment is designed and manufactured at our facility in the United States.

This manual is designed to teach an operator how to setup and use the Model CX-2000. Included within these pages you will find information on our proprietary orbiting blade technology, instructions on programming the CX-2000, mechanical setup and adjustments, and troubleshooting tips.

Every attempt has been made to provide the customer with all of the necessary information for successful application and operation of the CX-2000 with this manual. However, if you should have additional questions or need additional assistance, please let us know. Our telephone number is 315.673.4761. Our fax number is 315.673.0979.

We can also be reached by e-mail at sales@coaxstrippers.com. Our web address is http://www.coaxstrippers.com. Please check our web site often for the latest news or updates concerning the CX-2000.

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A Note To Our Customers

Every attempt has been made during the development of this Operators Manual to include all relevant information pertaining to the operation and maintenance of the CX-2000 Programmable Coaxial Cable Stripper, in a concise, easy to read and easy to apply format. However, the CX-2000 is a complex piece of equipment and certain inaccuracies or typographical errors may inadvertently be contained within these pages. Orbital Technologies, Inc. shall not be held liable for these errors. We welcome customer input concerning this manual. If you should find an error or have a suggestion on how this manual could be enhanced, please feel free to contact us.

Disclaimer

A great amount of work has gone into the development of the CX-2000, in order to offer a product that is universally applicable to stripping the many varied types of cables within its range of specifications. There may, however, be cables that fall within the CX-2000 operating range that do not process satisfactorily on the CX-2000. This may be due to many factors including but not limited to cable construction, poor cable/material quality and/or required strip specifications. It is always recommended that actual cables and strip specifications be submitted to Orbital Technologies, Inc. for evaluation to determine if the CX-2000 will perform the stripping requirements satisfactorily.

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Product description

The Orbital® Model CX-2000 is a fully programmable wire and coaxial cable stripper. It is designed to strip a wide range of wire and cables up to a maximum outer diameter (O.D.) of .275" (6.98 mm). Overall strip length is programmable up to 1.500" (38.10 mm). The CX-2000 uses Orbital's exclusive ***Orbiting Blade Technology*****.** Please see the **Theory of Operation** section elsewhere in this manual for a better understanding of this unique stripping technology.

The CX-2000 is microprocessor controlled and fully user programmable via a large graphical user interface (GUI) consisting of a 240 x 128 LCD graphics panel for easy viewing, combined with an efficiently designed keyboard and an extremely user-friendly programming interface. Additionally, the CX-2000 uses *Single-Screen Programming*. All required strip data is entered onto a single LCD screen, simplifying setup and reducing confusion by eliminating paging through multiple display screens during setup.

Up to 5 separate strip steps can be programmed, accommodating both coaxial and triaxial type cables. All required strip parameters are programmable including strip length, pull length, cut diameter, cutter blade step-back, cut dwell time etc… Unit can be programmed in inches or millimeters. Up to 999 programs may be stored in the CX-2000's battery-backed memory. A ten character name field is provided so that an operator can name each cable program alpha-numerically.

Specifications

▪ Stripper Type	Orbiting blade (see **Theory of Operation** for more information)
▪ Maximum Cable Diameter	0.275" (6.98 mm)
▪ Maximum Strip Length	1.500" (38.10 mm)
▪ Maximum Pull Length	0.000" – 1.500" (0.00 mm – 38.10 mm)
▪ Step-Back	0.000 – 0.050" (0.00 mm – 1.27 mm)
▪ Cut-Dwell	0 – 3.0 seconds
▪ Blade feed rate	4 speeds user selectable
▪ Pull speed	4 speeds user selectable
▪ Cycle Time	Typical 3 step strip 7 to 10 seconds*
▪ Maximum number of strip steps	5
▪ Programming Units	Inches or Millimeters user selectable
▪ User Program Memory	999 maximum locations – battery backed
▪ Password Protection	User programmable
▪ Cable Naming	Up to 10 alpha-numeric characters
▪ Cable Guide System	Interchangeable aluminum guide bushing
▪ Cable Centering	100% field adjustable cable centering
▪ Guide Bushing Storage	Built-in storage for up to 10 guide bushings
▪ Safety Guard	Lexan (removable)
▪ Safety Interlock	Electrical interlock on Safety Guard
▪ Display Type	240 x 128 graphic LCD, CCFL backlight
▪ Keypad Type	Proprietary membrane/mechanical switch w/tactile feedback
▪ Cycle Actuation	Push-button switch (connector for footswitch also included)
▪ Cooling	Convection
▪ Electrical Requirements	80 – 265 VAC, 47 – 63 hz, 3 amp max.
▪ Main Fuse Type	5x20mm 4.0 amp type (2 required)
▪ Dimensions	8.5" x 16.2" x 12.0" (W x L x H)
▪ Weight	35 lbs. (15.9 kg.)

* Cycle time will vary based on programmed setup parameters

Note: Specifications are subject to change without notice. Orbital Technologies, Inc. has a policy of continuous product improvements and reserves the right to change specifications, designs or prices anytime without notice or the incurring of any obligations.

Section 1 - Theory of Operation

Introduction

The Model CX-2000 uses Orbital's proprietary Orbiting Blade Technology. Prior to the commercial availability of Orbiting Blade Technology from Orbital Technologies, Inc., there were two primary technologies found in production wire processing equipment – Rotary Blade Technology and V-blade Technology. Also available, though much less prevalent due to the high cost of the technology, is Laser Stripping Technology.

In order to obtain the maximum application flexibility of your Orbital Technologies, Inc. equipment, a general understanding of how an Orbiting Blade stripper works is desirable. This section will look at the theory behind Orbital's exclusive Orbiting Blade Technology.

Orbiting Blade Technology

An orbiting blade wire stripper uses a uniquely designed cutter blade consisting of a steel or carbide "plate" with a hole sharpened to a knife edge, (see Figure 1.)

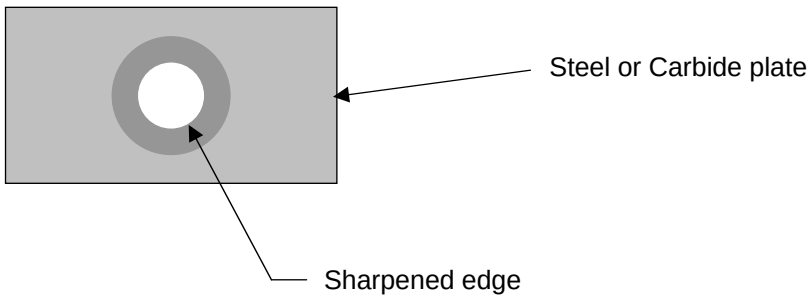

Figure 1. – Typical Orbiting Cutter Blade

To cut the layer(s) of a wire or cable, the wire is inserted through a guide bushing (used to center and support the cable) directly adjacent to the cutter blade and through the sharpened hole of the cutter blade. Next, the cutting edge of the blade is orbited around the wire as it is fed toward the wire to the desired cutting depth (see Figure 2.)

This is accomplished by a unique mechanism that generates the orbiting action while allowing the radius of the orbit, and hence the diameter to which the blade cuts, to be completely adjustable.

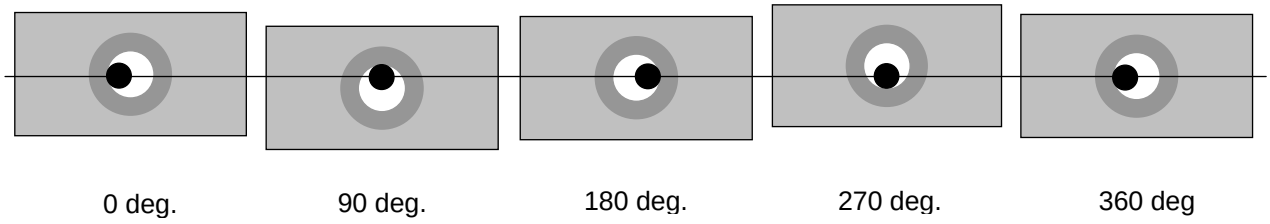

Figure 2. – Path of Orbiting Blade

Since the blade is orbited completely around the circumference of the wire, it produces a clean and consistent cut. And, since the full 360^{o} of the cutting edge is used to sever the wire, the blade life is typically much greater than that of a rotary type stripper.

A typical rotary type stripper uses one or two blades and, like the orbiting blade stripper, cuts completely around the circumference of a wire. But the rotary stripper uses only a single point along the cutting edge of the blade(s) to do 100% of the cutting. Hence, one key advantage of an orbiting blade stripper over a rotary stripper is greater blade life.

Another advantage of an orbiting blade stripper over a typical rotary stripper is the square cut that is produced. The blade of the orbiting cutter is moved at an exact right angle to the axis of the cable, providing a perfectly square cut. In most rotary machines, the blades move toward the axis of the wire on an arc, which has the tendency to "point" the cut shoulder rather than giving a perfectly square cut.

One potential disadvantage of an orbiting blade stripper as compared to a dual-blade rotary stripper is in the strip slug removal capabilities. The typical dual-blade rotary stripper has two opposing blades that sever the layer(s) to be removed. After the layer(s) are cut, the blades are also used to pull the slug off the end of the wire. This is possible because the two blades "capture" the slug during pull-off. See figure 3.

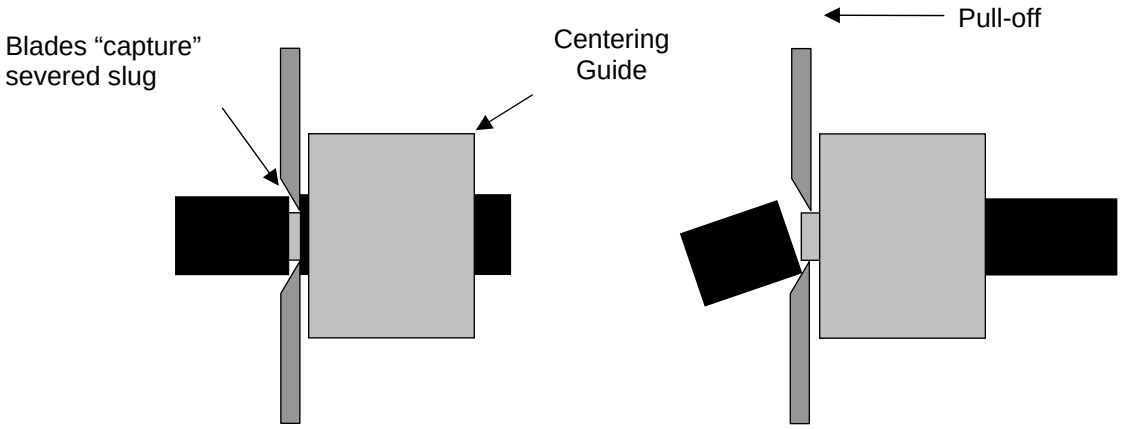

Figure 3. Rotary Stripper 2-Point Slug Removal Method

The orbiting blade stripper has only a portion of the blade engaged with the severed slug at pull-off time. In most instances, this limited blade engagement is not sufficient to pull the slug off, since the wire has a tendency to deflect away from the blade edge as the blade is moved along the wire.

To compensate for this situation, a pair of "Gripper Blades" are added to grip the severed slug before pull-off. Additionally, the Gripper Blades can be used alone for stripping. There are many types of hookup wire, for example, that can be stripped using just the gripper blades for both severing the jacket and pulling off the slug. This can improve production rates on jobs where a precise rotary type cut is not required.

On the CX-2000 programmable orbiting blade stripper, the amount that the Gripper Blades grip the slug is fully programmable, referred to as the "Pull Diameter". Since the blades that pull the severed slug are independent of the cutter blade, it is not necessary to program a blade withdraw amount (typically referred to as "stepback" or "wayback"). Just program the "Cut Diameter" that the cutter blade should cut to ("CUT" parameter), and separately program the diameter the gripper blades should close to remove the slug (PULL parameter under Diameter data section).

Another characteristic of an orbiting blade stripper that is worth noting is the fact that the cutter blade cuts in an offset manner. Unlike a dual blade rotary stripper that has two opposing blades that tend to help capture and cut the cable on center, the orbiting blade stripper cuts by “pushing” against the cable as the cutting edge is orbiting around it, using the wire guide bushing to act as the cable stop (see Figure 5 below). The more clearance there is in the wire guide bushing, the farther off the cut axis (cut center) the cable will be pushed.

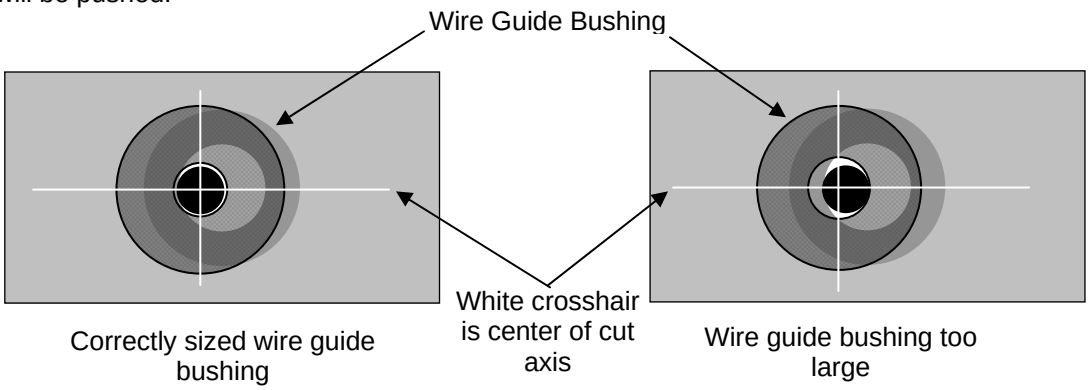
Wire Guide Bushing
White crosshair is center of cut axis
Correctly sized wire guide bushing
Wire guide bushing too large

Figure 5. – Cut Offset vs. Wire Guide Bushing Fit

In an orbiting blade stripper in which the cut diameter is programmable, the farther the cable is offset from cut center due to excessive bushing clearance, the deeper the blade cut diameter will need to be programmed in order to achieve the correct cut results. This may result in programmed cut diameter values that vary considerably from the diameters actually measured from the cable. Essentially, the cutting depth is required to compensate for too much clearance in the guide bushing, or other tolerances in the cutter mechanism. Aside from the cut diameter programming issues, in most cases this offset characteristic has a minimal effect on strip quality and repeatability.

It is important to use a wire guide bushing that is correctly sized for the cable being processed. The optimum wire guide bushing size is typically .003” - .005” larger than the average measured cable outer diameter, depending on the cable characteristics. It is possible to obtain satisfactory stripping results with considerably more clearance than this, due to the fact the cable is always offset the same amount wherever the blade is in its orbit. However, the most precise strip results will always be obtained with a correctly sized wire guide.

Section 2 - Your New CX-2000

2.1 *Unpacking and Inspection*

Note: Before unpacking the unit, check the box for any damage that may have occurred during shipping. Any damage claims should be filed directly with the carrier.

1) Carefully open the top of the shipping box.
2) Remove the cardboard pad from under box top flaps.
3) Remove the Lexan safety guard from the box and remove the protective film from both sides of the guard.
4) Remove the power cord from the box.
5) Carefully lift the CX-2000 from the box. Remove the foam packing materials from the sides of the unit and remove the unit from the protective plastic bag. Place the unit on a sturdy bench top.
6) Check to be sure that there are no loose screws or other objects inside the shipping box. If any loose objects are found, please contact the factory.
7) Check the unit to be sure there is no obvious physical damage. Claims for damage during shipping should be filed directly with the carrier.
8) Remove the rubber band securing the thumb screw at the front of the cutter unit.
9) Install a wire guide bushing as necessary. See Section 3.3 – Wire Guide Bushing Installation and Removal.
10) Install the Lexan safety guard on machine. See Section 3.1 – Safety Guard Installation and Removal. Note: The unit will not cycle without the Lexan safety guard installed.
11) Plug the supplied IEC style power cord into the power entry module on the back of the unit.
12) It is strongly suggested that the box and packing materials be retained for use if the unit should have to be returned to the factory for repairs or shipped to another location.
13) Please read this Operator's Manual thoroughly before applying power to the unit.

2.2 *Shipping the Unit*

If it is necessary to ship the unit to another location, please follow these instructions:

1) Remove debris tray and empty contents. See Section 3.2 – Debris Tray Installation and Removal. Wipe tray out with cloth if necessary. **This step is *very important*.**
2) Replace debris tray, being sure to tighten the thumb screw securely to prevent it from vibrating loose during shipping.
3) Remove power cord from back of unit and bundle cord with a twist tie.
4) Remove the Lexan safety guard and carefully wrap with tissue paper and place in a plastic bag to protect from damage.
5) Remove Wire Guide Bushing. See Section 3.3 – Wire Guide Bushing Installation and Removal.
6) Carefully pack the unit into the originally supplied box using the foam pieces supplied.
7) If the original shipping materials are not available, be sure to pack the unit very carefully to prevent damage during shipping.

Note

Unit must be at room temperature before applying power. If unit is moved from one location to another of a different temperature, please allow unit to set for one hour prior to applying power. Failure to follow these instructions may cause serious damage and unit failure !

2.3 *Installation*

1) Before applying power to the unit, please read this manual thoroughly.
2) Plug the unit into an AC power source of between 85 and 265 VAC, 47 to 63 hz.
3) Turn the power switch on the power entry module (back of unit) to the ON (1) position.
4) After a moment, the LCD display will show the Orbital logo, the software version, unit serial number and a prompt for the operator to press ENTER.
5) Press the ENTER key.
6) The unit will enter "Self Calibration Mode".
7) After completion of the self-calibration mode, the unit will enter "Run Mode" and the LCD display will show the currently programmed setup. This is the "Run Screen" (See Figure 2-1).
8) To process cables with the currently displayed setup, proceed to Section 2.4- Pre-Processing Checks.
9) To edit the current setup or perform other programming operations, please see Section 4- Programming the CX-2000.

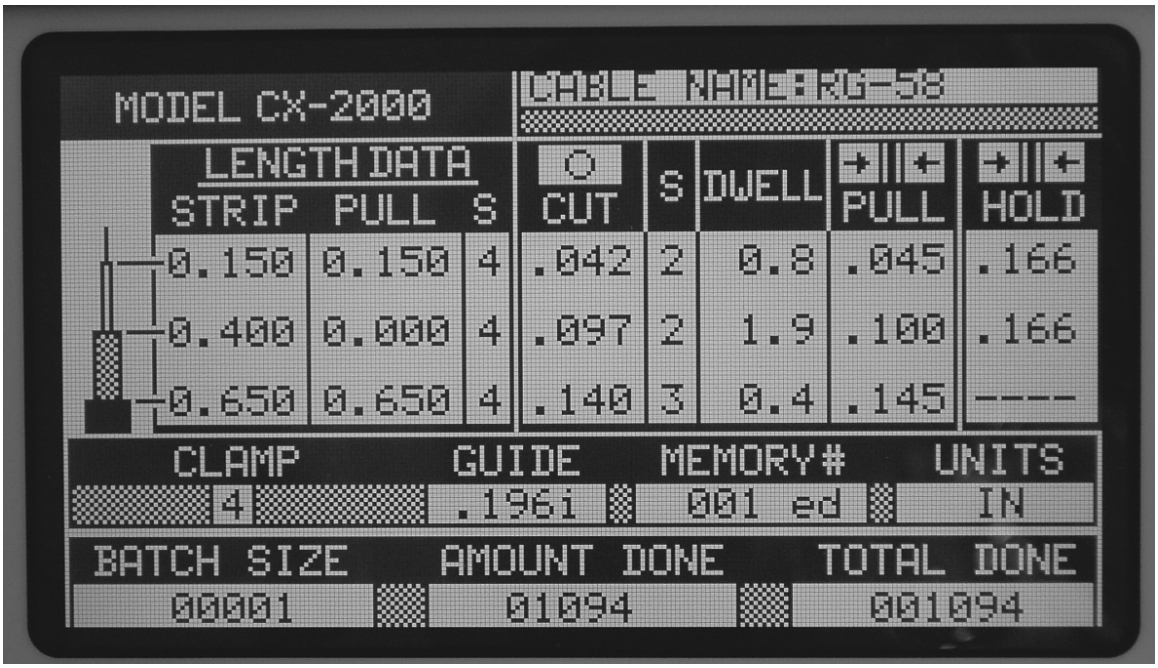

Figure 2-1 CX-2000 "Run Screen"

2.4 *Pre-Processing Checks*

Before processing cables on the CX-2000, the following steps must be performed:

- Power must be applied to the unit and the unit must be in the "Run Mode".
- The desired cable strip specifications should be displayed on the LCD screen when unit is in the "Run Mode". If the cable data displayed is not correct, edit the data by entering "Edit Mode". See Section 4.3 - Edit Mode.
- Be sure that the "Processing Options" settings are correct. See Section 4.4.1- Process Options.
- The correct size *Wire Guide Bushing* should be installed in machine. See Section 3.3 – Wire Guide Bushing Installation and Removal.
- The Lexan safety guard should be installed on machine. Section 3.1 – Safety Guard Installation and Removal.

  Note: The unit *will not cycle* without the Lexan safety guard installed.

After performing the above steps, proceed to Section 5 - Processing Cables.

Section 3 – Mechanical Setup and Adjustments

Section 3.1 Safety Guard Installation and Removal

The CX-2000 has a Lexan safety guard which must be installed before cable processing can begin. To install the safety guard, refer to figure 3-1 and the following steps;

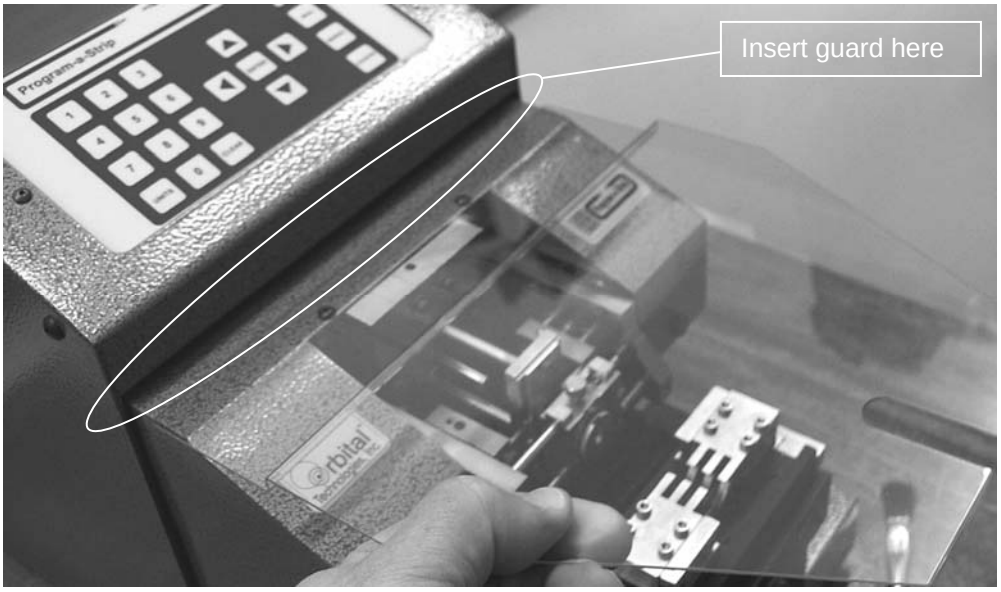

Figure 3-1 Installing the Safety Guard - Rear

1) Insert the rear (wide end) of the safety guard into the slot beneath the CX-2000 front panel. See figure 3-1 above. Note that the bend in the front (narrow end) of the guard should be pointing down.
2) Insert the front (narrow end) of the safety guard into the slot below the wire clamp jaws. See figure 3-2 below.
3) Tighten the thumb screw securely.
4) Reverse the above steps to remove the safety guard.

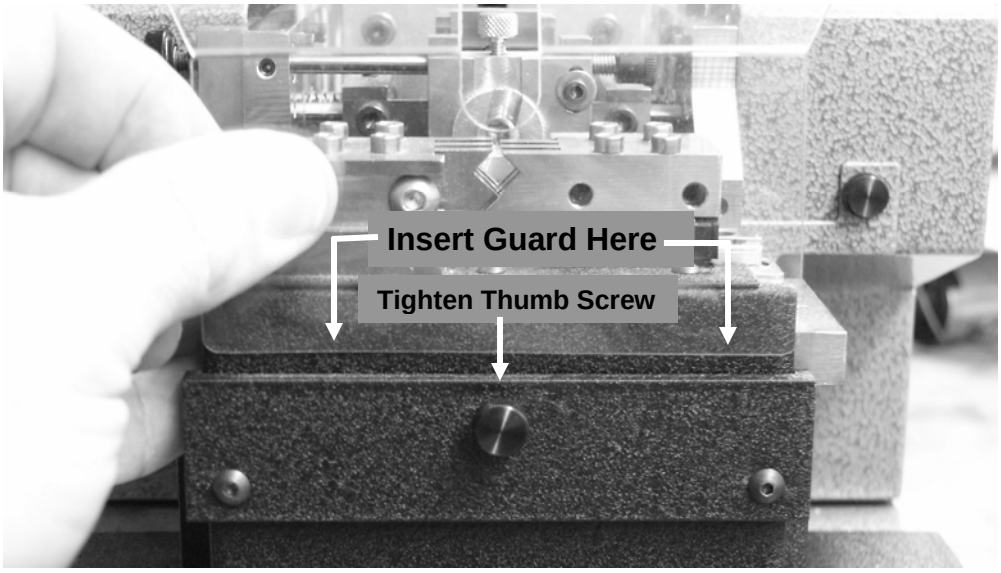

Figure 3-2 Installing the Safety Guard – Front

Section 3.2 Debris Tray Installation and Removal

The CX-2000 contains a removable debris tray. Follow the steps below to install or remove the tray.

1) The CX-2000 Debris Tray has formed “fingers” on its left end (see Figure 3-3) that hook on the bottom inside left edge of the front carriage cover.

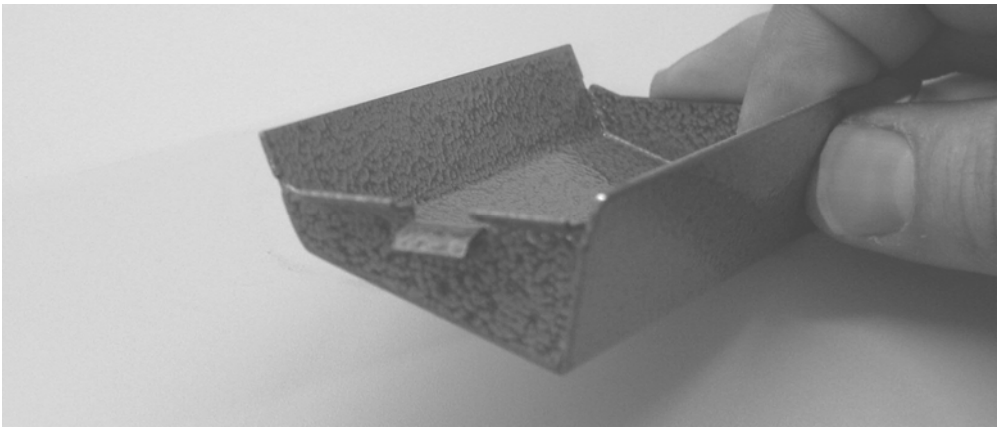

Figure 3-3 Debris Tray Retaining Fingers

2) To install the Debris Tray, slide the debris tray underneath the cutter assembly and hook the debris tray retaining fingers on the lower inside left edge of the front carriage cover assembly. See figure 3-4.

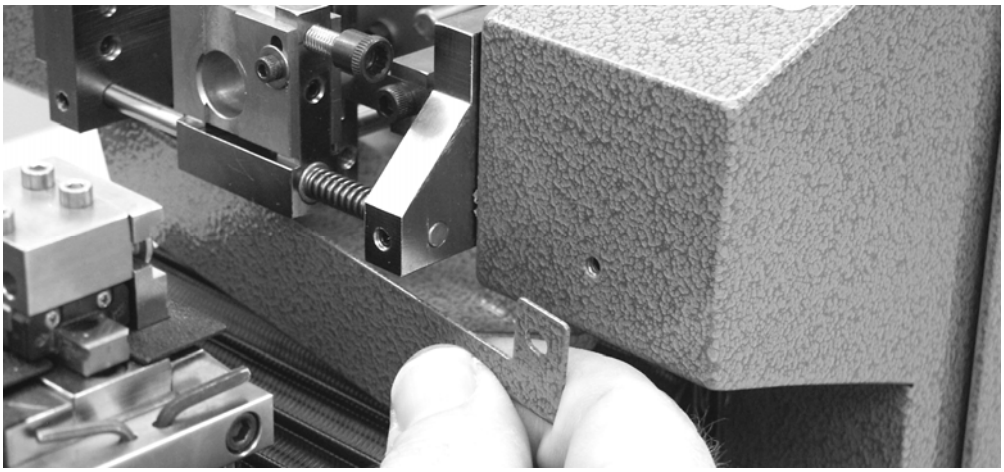

Figure 3-4 Debris Tray Installation

3) Align the slot in the debris tray retaining tab with the tapped hole on the front right side of the carriage cover and install the 6-32 thumb screw and tighten securely. See figure 3-5.

4) Reverse steps 2 and 3 to remove the debris tray.

Section 3.2 Debris Tray Installation and Removal (cont.)

Figure 3-5 Debris Tray Retaining Tab/Thumbscrew

Note: It is important that the debris tray be emptied regularly to prevent a buildup of strip debris around the cutter drive plates and front carriage cover, etc. Any damage to the unit that is determined to be a result of failure to keep the debris tray emptied is not covered under the machine warranty.

Section 3.3 Wire Guide Bushing Installation and Removal

The CX-2000 uses easily interchangeable aluminum guide bushings to center and support the cable throughout the strip process. This guide bushing is secured in place by a single thumb screw. See figure 3-6 below.

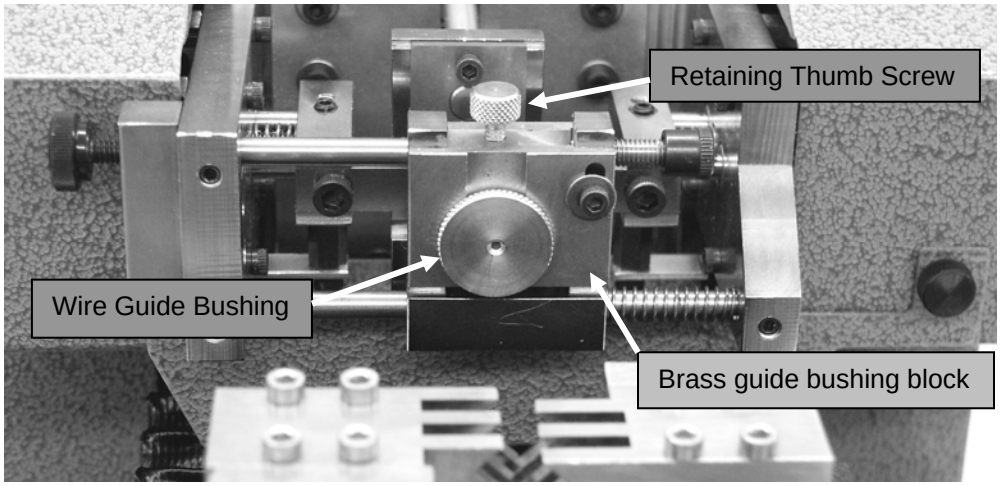

Figure 3-6 Guide Bushing and Retaining Screw

Section 3.3 Wire Guide Bushing Installation and Removal (cont.)

To install a wire guide bushing:

1) Remove the Lexan safety guard from the CX-2000. (See section 3.1).
2) Insert the narrow end of the desired guide bushing into the brass guide bushing block until the shoulder at the front of the bushing stops against the bushing block. See figure 3-7 below. Tighten the thumb screw against the bushing securely.
3) Replace the Lexan safety cover.
4) Be sure to enter the wire guide size that is marked on its face into the GUIDE data field (see (5) in Section 4 – Programming The CX-2000)
5) To remove the wire guide bushing. Reverse steps 1 – 3 above.

Note: If the longest programmed strip length is less than 0.500" (12.7mm), it may be difficult to change the wire guide bushing. If this occurs:

A) Temporarily program the longest strip length to 1.500" (38.1mm). See Section 4.3 Edit Mode for information on programming.

B) Install the wire guide bushing (see Steps 1 – 5 above).

C) Reprogram the correct length changed in step A) above.

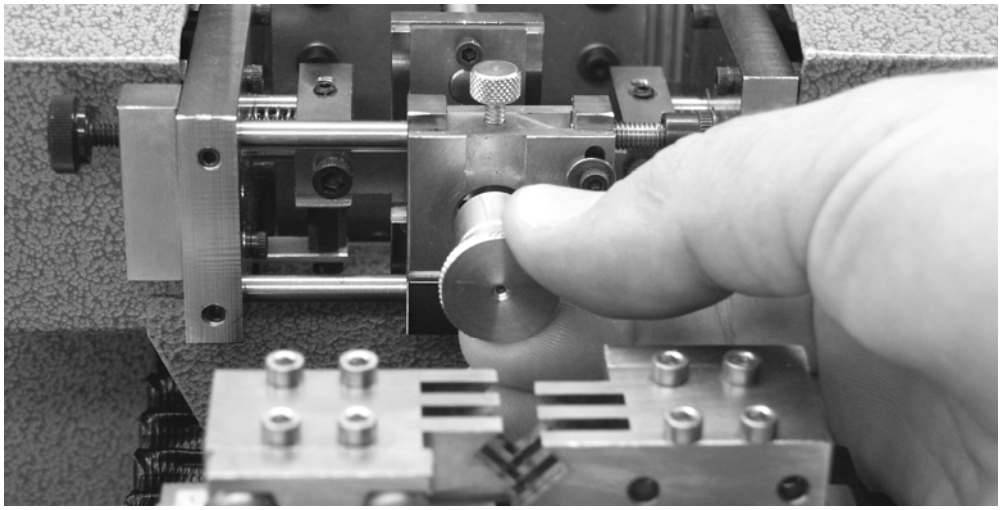

Figure 3-7 Wire Guide Bushing Installation and Removal

Section 3.4 Cutter Blade Replacement

The CX-2000 cutter blade has two alignment holes that capture two locating pins protruding from the front of the blade holder assembly. One hole is round and the other is oblong. The blade is held in place by two 4-40 x 3/8" cap screws. The wire guide bushing holder is designed such that it can be easily moved out of the way to facilitate cutter blade replacement, and be returned to its original position without affecting the cable centering. To replace the CX-2000 cutter blade, proceed as follows. Refer to figure 3-8 for parts identification.

1) Make sure the CX-2000 is powered up and in Run Mode.
2) Select "2) BLADE CHANGE" from the CX-2000 CONFIGURATION MENU. See sections 4.4 and 4.4.2 for more information.
3) Remove the Lexan safety guard from the CX-2000. See *Section 3.1 Safety Guard Installation and Removal* .
4) Remove the Debris Tray. See *Section 3.2 Debris Tray Installation and Removal*.
5) Using the smaller hex key wrench supplied with the CX-2000, verify that the *"X" Locking Screw* is tight.
6) Turn the *"X" Adjusting Screw* ½ turn back (CCW) then turn it in (CW) until it stops**.** *Do not force it beyond the point it stops at.* Later models do not have a thumbscrew. Use the small hex key wrench to make adjustments.

   Note: Make sure the "X" Adjusting Screw is not moved while performing the following steps.
7) Using the small hex key wrench, loosen the *"X" Locking Screw*.

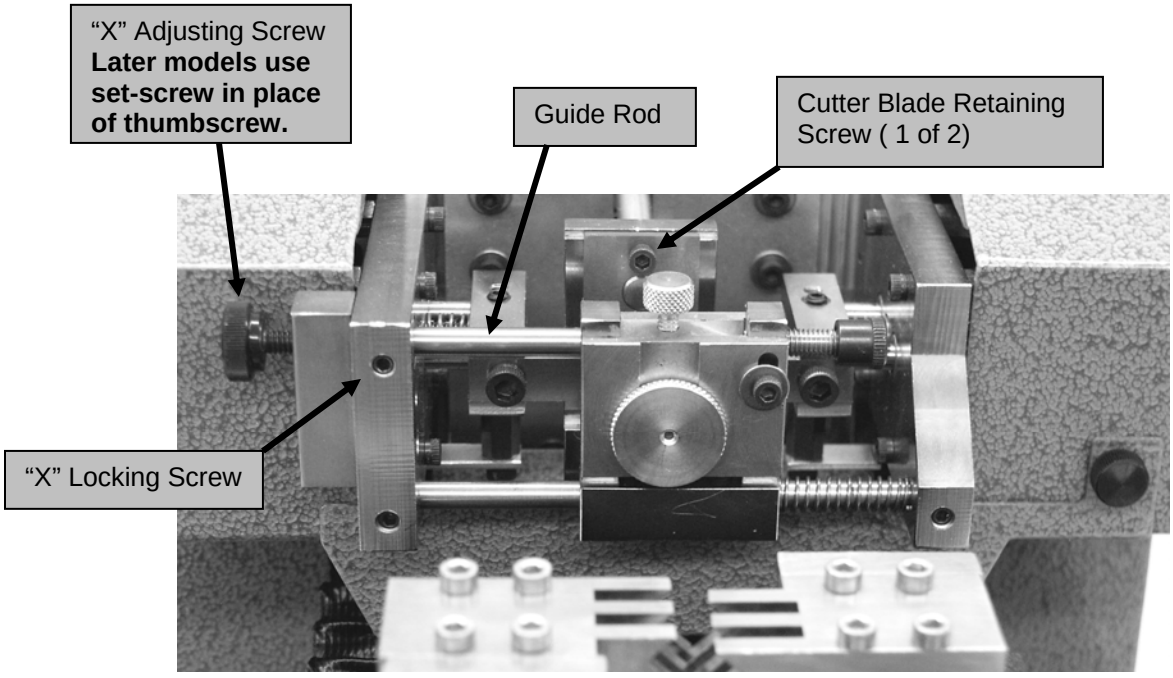
"X" Adjusting Screw
Later models use set-screw in place of thumbscrew.
Guide Rod
Cutter Blade Retaining Screw (1 of 2)
"X" Locking Screw

Figure 3-8 Blade Change Parts Identification

Section 3.4 Cutter Blade Replacement (cont.)

8) Referring to figure 3-9 below, slide the guide bushing block to the right until the top guide rod is clear of the bronze bearing on the left side.

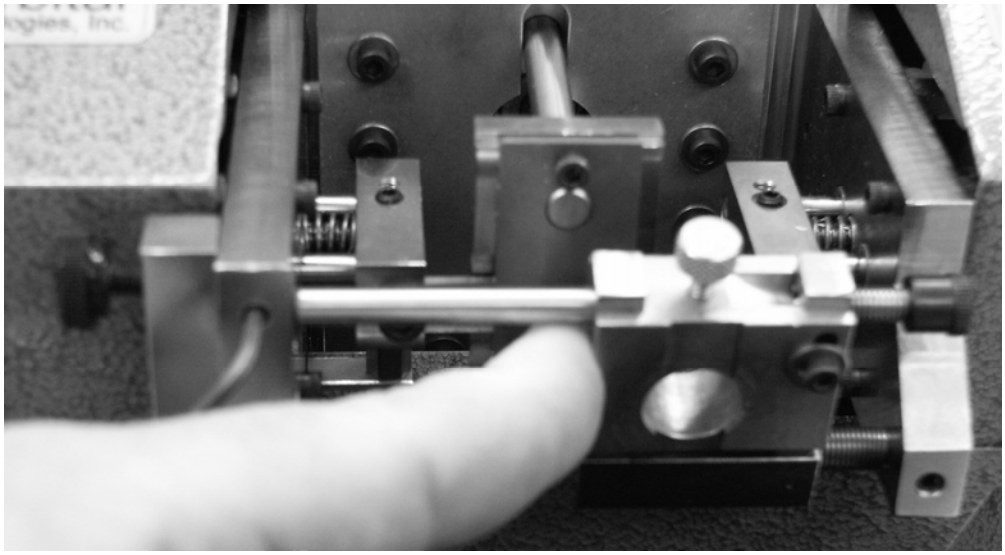

Figure 3-9 Slide the Guide Bushing Block to the Right

9) Next, rotate the entire assembly downward and slide it to the leftmost possible position, revealing the cutter blade. See figure 3-10.

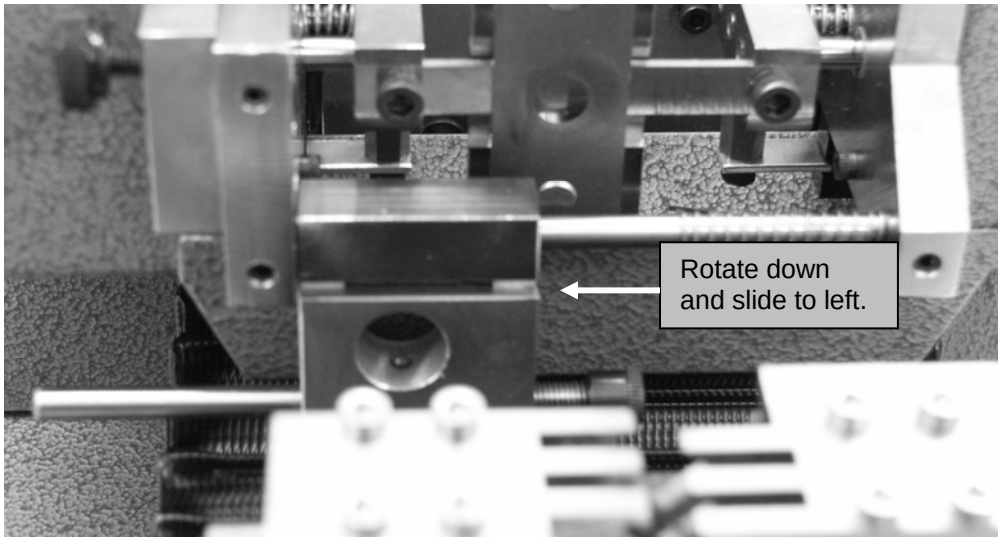

Figure 3-10 Move Guide Bushing Block Out Of the Way

Section 3.4 Cutter Blade Replacement (cont.)

10) Referring to figure 3-11 below, remove the two 4-40 cap screws that retain the blade and gently remove the blade from the two locating pins.

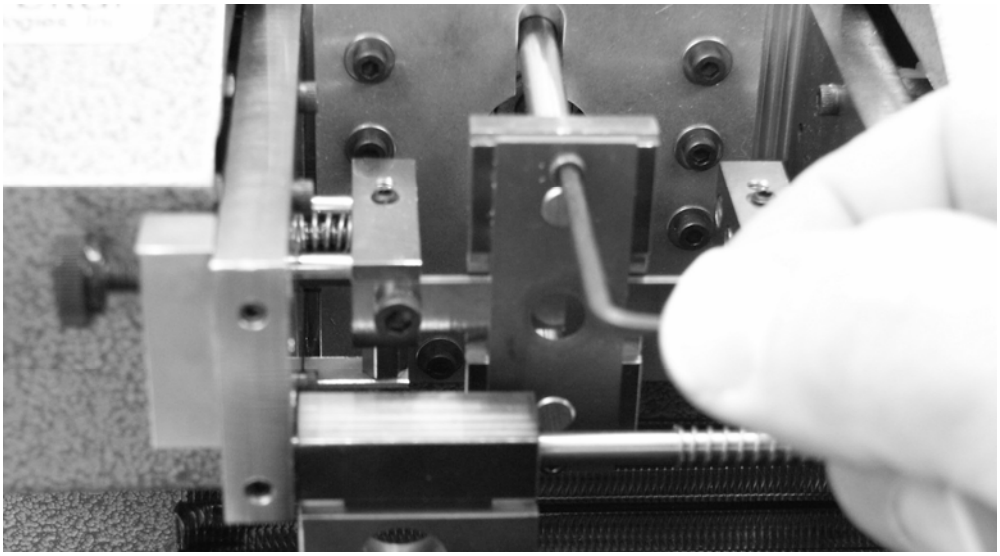

Figure 3-11 Remove the Blade Retaining Screws

11) Figure 3-12 shows a close up view of the CX-2000 cutter head with the cutter blade removed.
12) To install the new blade, position the blade so that the flat side of the blade is facing the front of the CX-2000 and the oblong hole is located on the lower locating pin. Next, reverse steps 3 – 5 and 7 – 10 above.

! Note

13) Verify that the blade size marked on the flat side of the blade near the round locating hole matches the value in the "Current Blade Diameter" data field. If the values do not match, enter the blade size marked on the new blade or the blade packaging into the "Current Blade Diameter" data field using the number keys.
14) Be sure that the *"X" Locking Screw* is tight before proceeding to process cables.
15) When all of the steps above have been completed and the Lexan safety guard is installed on the CX-2000, press the ENTER key to return to Run Mode. The CX-2000 will Auto Calibrate and be ready to run.
16) Check the blade centering as instructed in Section 3.6 of this manual. It is sometimes necessary to adjust the centering adjustment slightly, after replacing the cutter blade due to manufacturing tolerances.

Note: Do not attempt to re-grind the cutter blade. Re-grinding will affect the calibration and alignment of the unit.

Section 3.5 Gripper Blade Replacement

The CX-2000 gripper blades are retained by one 8-32 x ¼" Socket Head Cap Screws. To replace these blades, please refer to the following steps.

1) Before replacing the CX-2000 Gripper Blades, the cutter blade must be removed. See *Section 3.4 Cutter Blade Replacement* for information on removing the cutter blade.
2) Figure 3-12 below shows the CX-2000 cutting head with the cutter blade removed, revealing the Gripper Blades and mounting screws.

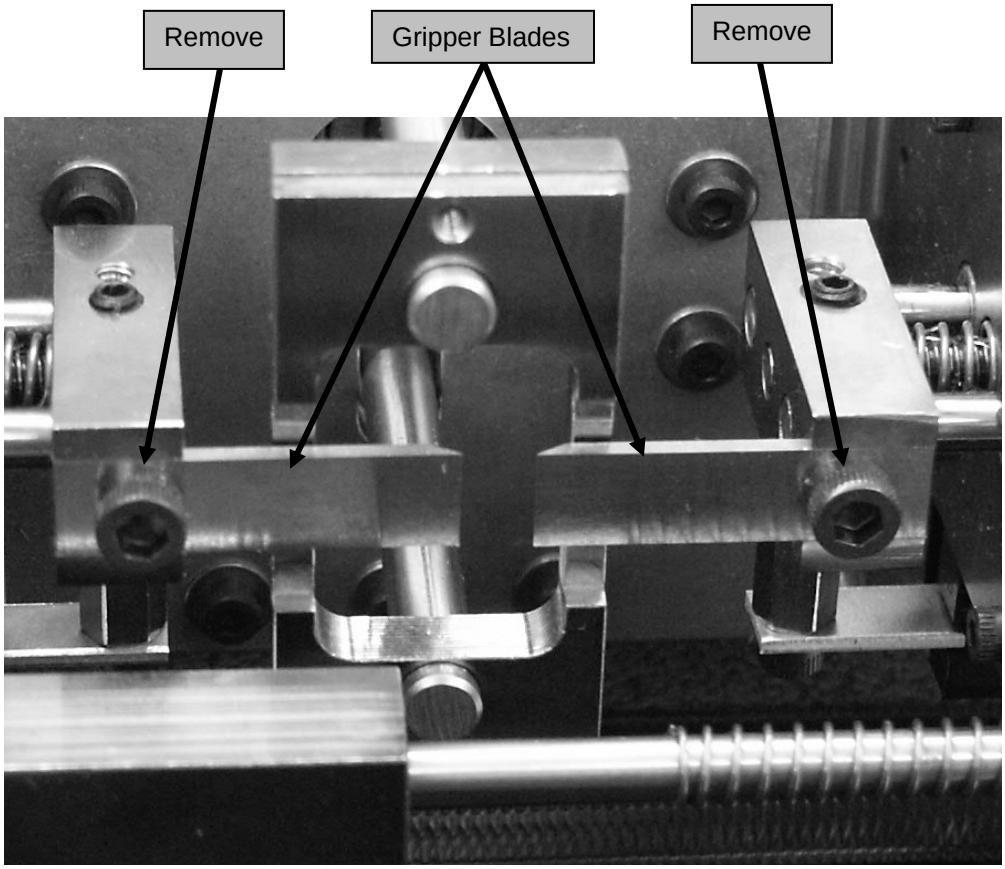

Figure 3-12 CX-2000 Gripper Blade Replacement

3) Remove the 8-32 screw that retains each of the gripper blades and carefully remove the blades from the slotted holders.
4) Install the new pair of gripper blades, making sure the flat side of the blade is facing the front of the machine as shown in figure 3-12.
   Note: The gripper blades must always be replaced in pairs.
   Note: The gripper blades must not be re-ground. Re-grinding of the gripper blades will affect system calibration and performance.

Section 3.5 Gripper Blade Replacement (cont.)

5) Re-install the cutter blade following the instructions in *Section 3.4 Cutter Blade Replacement.*

Section 3.6 Cable Centering Adjustments

3.6.1 General Information

For precise strip results, it is extremely important that the center of the cable be positioned in the exact center of the blade orbit path. The CX-2000 has a unique adjustable wire guide bushing centering system to facilitate precise cable centering. Figure 3-13 below identifies the components used to adjust the guide bushing centering.

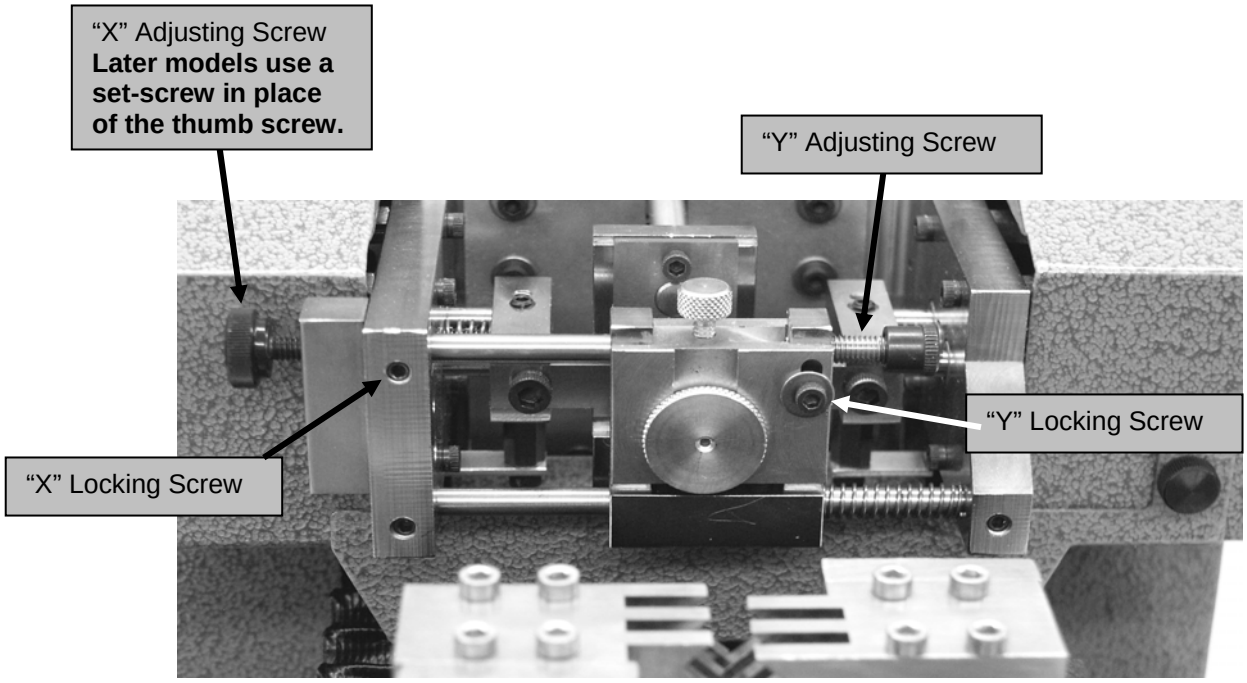
"X" Adjusting Screw
Later models use a set-screw in place of the thumb screw.
"Y" Adjusting Screw
"Y" Locking Screw
"X" Locking Screw

Figure 3-13 Cable Centering Adjustment Components

The cable centering adjustment is preset at the factory and modifications of this adjustment are seldom necessary. There may however be times when it is desirable to slightly adjust the cable centering adjustment in the field, for optimum stripping results.

Figure 3-14 shows two stripped ends of an identical cable. Cable "A" is a typical example of a cable stripped on a machine with the cable centering out of alignment. Notice the strands on the braid that were not severed completely.

Section 3.6 Cable Centering Adjustments (cont.)

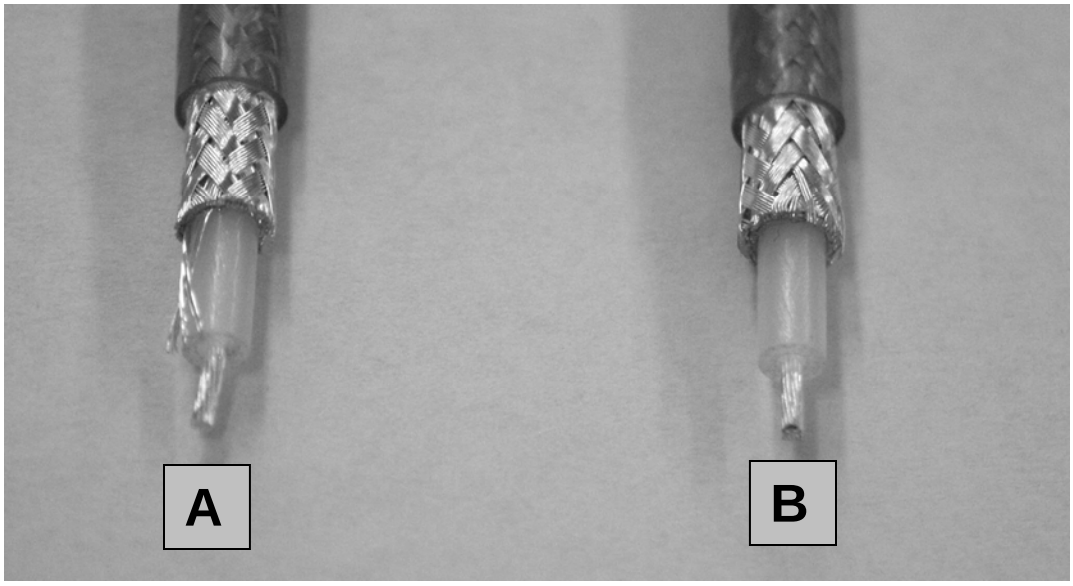

Figure 3-14 Stripped Cable Ends

When cable “A” is viewed under magnification, it is noticed that, opposite the uncut braid, the blade cut too deeply into the dielectric. Further examination reveals that the braid at the jacket cut is nicked on the same side that the dielectric is cut too deeply. Opposite the nicked braid, there is an excess amount of jacket that was “torn” during the slug pull-off. See figure 3-15.

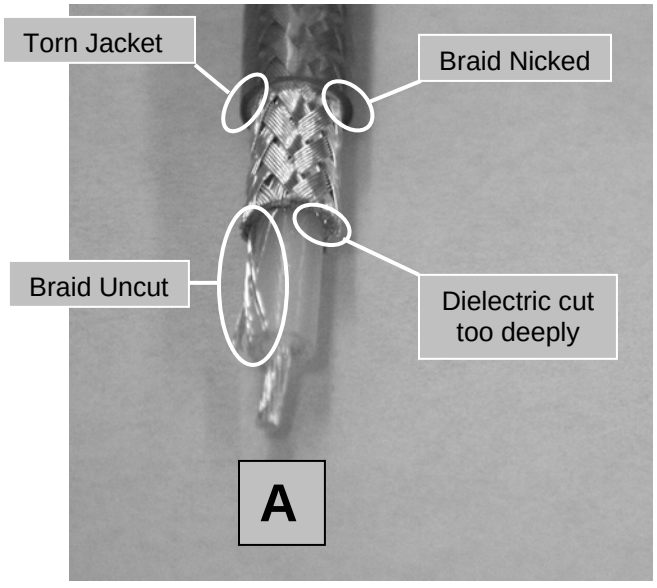

Figure 3-15 Poorly Aligned Strip

Section 3.6 Cable Centering Adjustments (cont.)

Figure 3-16 below shows the same strip performed on a correctly centered machine. The amount of jacket material left that was torn during the jacket slug pull-off step is consistent around the entire circumference of the cable, as is the tear around the center conductor. Likewise, the dielectric "score" is even around the entire circumference.

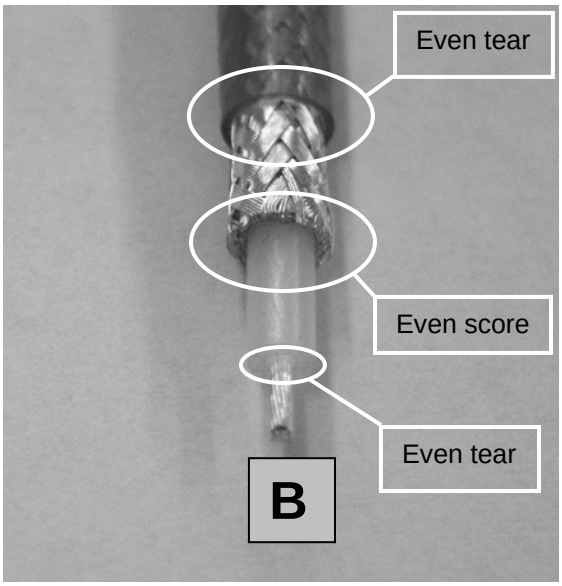

Figure 3-16 Correctly Aligned Strip

It is important to note that the quality of the cable being processed will have a direct bearing on achievable strip quality. There are many cables in the marketplace of poor quality and, in particular, poor concentricity. If the cable layers are not concentrically constructed, it will be very difficult to obtain a "perfect" strip on each layer. This poor concentricity may also lead an operator to believe the CX-2000 cable centering is not aligned correctly, when in fact the cable is to blame.

3.6.2 Determining the Adjustment Direction

To determine the direction in which the wire guide bushing must be moved to correct an out of center condition, use the following method.

1) With the machine in Run Mode, insert a piece of cable to be stripped through the clamp jaws and the wire guide bushing, until it stops against the blade.
2) Next, put a mark on the top side of the cable to use as a reference when the cable is removed from the machine.
3) Strip the cable.

Section 3.6 Cable Centering Adjustments (cont.)

4) Remove the cable from the machine and check it to see at what point on the cable, in reference to the top side mark, the blade cut the deepest. The wire guide must be moved in the exact opposite direction of the deepest point of the cut.

5) As an example, figure 3-17 represents a cable inserted into the CX-2000 as viewed from the wire clamp end of the machine. The cable is marked at the location shown. The dotted line represents the "cut". In this example, the cut is centered nicely in the "Y" direction, but it is off a considerable amount in the "X" direction. As indicated in the drawing, the "X" Adjustment Screw should be turned in the Counter-Clockwise (CCW) direction, to correct this situation.

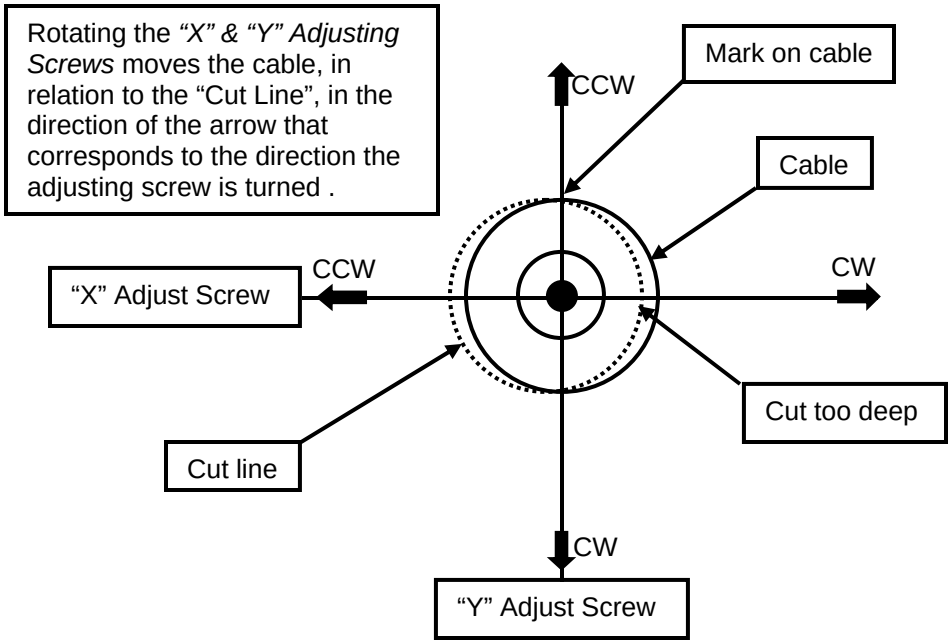
Rotating the *"X" & "Y" Adjusting Screws* moves the cable, in relation to the "Cut Line", in the direction of the arrow that corresponds to the direction the adjusting screw is turned .
Mark on cable
CCW
Cable
"X" Adjust Screw
CCW
CW
Cut too deep
Cut line
CW
"Y" Adjust Screw

Figure 3-17 Determining Center Adjust Direction

6) It is important to note that, in the above example, adjustment was required in only one direction. There may be occasions when changes to both the "X" and "Y" adjustments need to be made.

Section 3.6 Cable Centering Adjustments (cont.)

3.6.3 Performing the Centering Adjustments

To perform centering adjustments, please read and follow these steps carefully.

Note: Steps 1 – 4 below "memorize" the current centering location and must be performed prior to making any centering adjustments

1) Using the smaller hex key wrench supplied with the CX-2000, verify that the *"X" Locking Screw* is tight. See figure 3-8 for the location of the "X" Locking Screw.

2) Turn the *"X" Adjusting Screw* ½ turn back (CCW) then *slowly* turn it in (CW) until it stops**.** Later models do not have a thumbscrew. Use the small hex key wrench to make adjustments. ***Do not force it beyond the point it stops at***.

3) Using the larger hex key wrench supplied with the CX-2000, verify that the *"Y" Locking Screw* is tight. See figure 3-8 for the location of the "Y" Locking Screw.

4) Turn the *"Y" Adjusting Screw* ½ turn back (CCW) then slowly turn it in (CW) until it stops. ***Do not force it beyond the point it stops at.***

5) Refer to section 3.6.1 & 3.6.2 to determine the direction in which the "X" and/or "Y" Adjusting Screws need to be moved to correct the out of center condition.

6) If the centering needs to be corrected in the "X" direction, loosen *the "X" Locking Screw* one full turn then proceed to make the centering adjustment by turning the *"X" Adjusting Screw* in the required direction 1/8 of a turn. Tighten the *"X" Locking Screw* after making the centering adjustment.

   Note: Only turn the "X" Adjusting Screw a maximum of 1/8 turn at a time.

   Note: When making adjustments to the *"X" Adjusting Screw*, it is good practice to apply light finger pressure against the guide bushing block assembly in the direction of the "X" Adjusting Screw. The assembly is spring loaded in this direction however, applying additional pressure will insure that the guide bushing assembly correctly follows the "X" Adjustment Screw.

7) Strip a piece of cable to see if the desired centering adjustment has been achieved.

8) If further adjustment is required, repeat steps 6 and 7 until the desired "X" centering adjustment has been achieved.

Section 3.6 Cable Centering Adjustments (cont.)

9) If the centering needs to be corrected in the "Y" direction, loosen *the "Y" Locking Screw* one full turn then proceed to make the centering adjustment by turning the *"Y" Adjusting Screw* in the required direction 1/8 of a turn. Tighten the *"Y" Locking Screw* after making the centering adjustment.

   Note: Only turn the "Y" Adjusting Screw a maximum of 1/8 turn at a time.

10) Strip a piece of cable to see if the desired centering adjustment has been achieved.

11) If further adjustment is required, repeat steps 9 and 10 until the desired "Y" centering adjustment has been achieved.

Section 3.6 Cable Centering Adjustments (cont.)

3.6.4 Notes Concerning Cable Centering

1) It should be noted that the centering system used in the CX-2000 is much more precise than the construction of most cables in the marketplace today.

2) Before making centering adjustments, know why you are making the adjustment to avoid unnecessary adjustments. Examples of situations causing an off center condition may include poor quality cable, worn, out of tolerance, or off-center drilled wire guide bushing, wrong size wire guide bushing, mechanical problem, inadvertent turning of center adjusting screws, etc…

3) Careful consideration should be made before making any adjustments to the cable centering adjustments. If the centering is off by a very small amount, such as may be caused by wire guide manufacturing tolerances or cable tolerances, in many cases satisfactory strip results can be obtained by simply programming a slightly deeper cutting depth.

4) Evaluate the degree of cable centering precision required based on the required cable strip specifications and application before making centering adjustments.

5) Verify the quality of the cable construction before making any cable centering adjustments, to avoid repeated re-centering of the unit, only to find the problem is inconsistent cable.

6) It is recommended that only genuine CX-2000 wire guides manufactured by Orbital Technologies, Inc. be used in the CX-2000, to insure centering consistency.

Note: Orbital Technologies, Inc. will not be responsible for poor performance due to after-market or customer manufactured wire guides.

Section 3.8 Maintenance

3.7.1 General maintenance

The CX-2000 was designed to require a minimum amount of maintenance. It is recommended that the following maintenance procedures be performed:

- Be sure the debris tray is emptied regularly during processing.
- Check the condition of the condition of the Orbit Rod Seal Brushes (located behind the cutter blade) for signs of wear or missing/damaged bristles. Replace as necessary.
- Check the condition of the cutter blade. With the wire guide bushing removed from the unit, observe the condition of the blade cutting edge. If large chips are noted around the cutting edge, the blade should be replaced.
- Check the condition of the gripper blade edges by observing them from behind the cutter blade. If they appear dull or chipped, replacement is required.
- Keep the area around the clamp jaw assembly free from debris. A small flux brush works well for cleaning around the clamp assembly.
- In addition to the clamping jaws, stripping debris will eventually accumulate on other exterior portions of the CX-2000. It is recommended that the exterior portions of the CX-2000 be cleaned at least daily.

3.7.2 Bearing adjustment and lubrication

The bearings, slides and shafts that are used on the CX-2000 are pre-set and pre-lubricated at the factory. These items are not user-serviceable.

It is highly recommended that the CX-2000 be returned to the factory at 12 to 18 month intervals for routine bearing lubrication and adjustment.

Contact Orbital Technologies, Inc. for information on returning your CX-2000 to the factory for routine maintenance.

Section 3.7 Maintenance

3.7.3 Replacement parts

The following lists the user replaceable items in the CX-2000:

Part Number	Description
CX2000-126	Gripper blades (sold in pairs)
CX2000-160-XXX	Wire guide bushing (replace XXX with size)
CX2000-162HSS	Cutter blade (High Speed Steel w/ TiN coating)
CX2000-174	Orbit rod brush seals (sold in pairs)

Section 3.8 Guide bushing information

3.8.1 Stainless steel guide bushing sets

Complete stainless steel guide bushing sets are available from Orbital Technologies, Inc. in a variety of configurations. All sets are supplied in a quality stainless steel storage tray with a hinged polycarbonate cover. See below for part numbers of the various available sets. Contact the factory for availability and pricing.

10 pc. precision Stainless Steel guide bushing sets in 0.10mm increments

A2K050 1.00mm - 1.90mm
A2K051 2.00mm - 2.90mm
A2K052 3.00mm - 3.90mm
A2K053 4.00mm - 4.90mm
A2K054 5.00mm - 5.90mm
A2K055 6.00mm - 6.90mm

20 pc. precision Stainless Steel guide bushing sets in 0.10mm increments

A2K060 1.00mm - 2.90mm
A2K061 3.00mm -4.90mm
A2K062 5.00mm - 6.90mm

60 pc. precision Stainless Steel guide bushing sets in 0.10mm increments

A2K070 1.00mm - 6.90mm

120 pc. precision Stainless Steel guide bushing sets in 0.05mm increments

A2K075 1.00mm - 6.95mm

Section 4 - Programming The CX-2000

The Program-a-Strip® Model CX-2000 contains an advanced, highly integrated and user-friendly programming interface for entering cable strip data, as well as for setting software controlled options and user preferences. This programmability, along with a large, easy to read 240 x 128 LCD display and efficiently designed keypad, combine to make a **Graphical User Interface** (GUI) that is state of the art.

This section introduces the CX-2000 GUI and outlines the programmable functions available on the CX-2000, and offers detailed information on each functions use and individual programming considerations.

4.1 The CX-2000 Graphical User Interface

Figure 4-1 below shows a picture of the CX-2000 Graphical User Interface. In this picture, the CX-2000 is in the “Run Mode” and the LCD display shows the “Run Screen.” All programmable functions of the CX-2000 are accessed via this GUI.

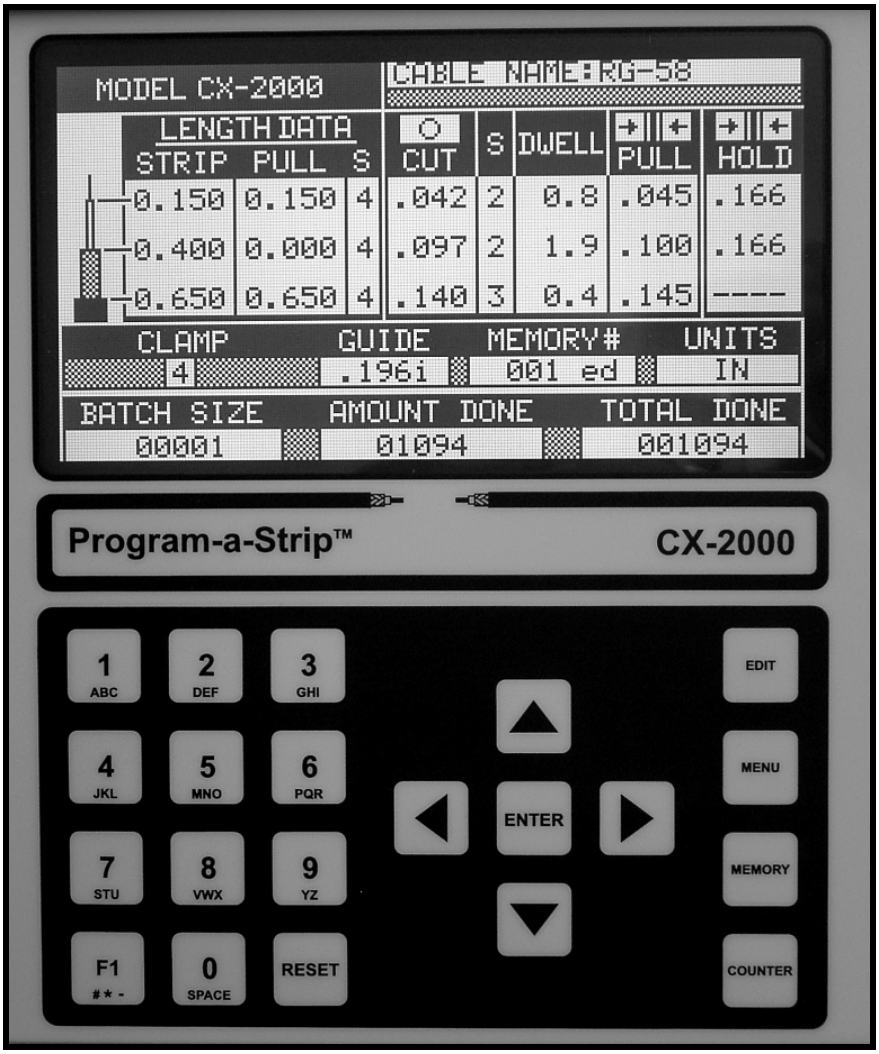

Figure 4-1 The CX-2000 Graphical User Interface (GUI)

4.2 The CX-2000 Keypad

This section describes the functions of the keys contained on the CX-2000 GUI keypad. Table 4.2.1 below lists all of the keys found on the CX-2000 keypad in the left column, and briefly lists their corresponding function in the right column. Refer to the individual section on each key with an asterisk (*) next to it for additional information on that keys function. Each key's location on the keypad can be found by referencing Figure 4-1.

	Key	Function
	0 Space - 9 Y Z	Numerical data entry, also function as letter keys and space character ("0" key) for Cable Naming
	F1 # * -	In "Edit Mode" this key is used to toggle "Clamp Test Mode", and for selecting "Data Line Move", "Gripper Blades Only" and "Grip Before Cut" modes. Also used to enter the characters # , * , - for Cable Naming
*	RESET	Used to clear a programming entry. Also used to toggle data in some CX-2000 programmable options. Executes "Auto Calibration" when in "Run Mode".
	▲ ◀ ▶ ▼	Used to navigate the cursor through all of the CX-2000 menu's.
	ENTER	Used to accept a programming value into the CX-2000 memory
*	EDIT	Used to enter "Edit Mode". This mode is used for entering all data pertaining to a cable end strip, selecting the programming units (inches or millimeters), entering the cable name and setting and testing the programmable clamp pressure.
*	MENU	Used to access the CX-2000 "Processing Options" menu, "Blade Change" function, "Password Setup" and "Reserved" menu's (the Reserved Menu's are for factory use only)
*	MEMORY	Used to access the CX-2000 memory functions which allow an operator to store or recall cable strip data in up to 999 memory locations.
*	COUNTER	Used to allow an operator to access and modify the CX-2000 Batch Counter, Amount Done Counter and Total Counter.

Table 4.2.1 CX-2000 Key Descriptions

4.3 Edit Mode – The EDIT *Key*

"Edit Mode" is used to enter or edit all of the data that is displayed and used in "Run-Mode" to process wire/cable ends. *Data cannot be edited in "Run Mode".* The data entered in "Edit Mode" may later be stored in one of the CX-2000's 999 memory locations for future retrieval and use by using the store function of "Memory Mode". (See Section 4.5 for information on Memory Mode.) Also, data recalled from any one of the CX-2000's memory locations may be modified while in "Edit Mode".

Figure 4-2 below shows a picture of the "Edit Screen" that is displayed when in "Edit Mode". All of the data required to program a complete cable end strip is entered and edited on this display. This is known as *"Single-Screen Programming"*.

To enter "Edit Mode", press the **EDIT** key. The display will show the "Edit Screen" and a black box will highlight the first data location (Length Strip – Step #1). This black box is referred to in this document as the "black data highlight cursor". The field highlighted by this cursor is the "active field" (the data to be edited). It can be positioned over any data field by using the four arrow keys. See the following pages for information on the individual data fields and editing of those fields. When editing is complete, press ENTER to return to the "Run Mode".

Note: When entering numerical data, the decimal point is entered automatically.

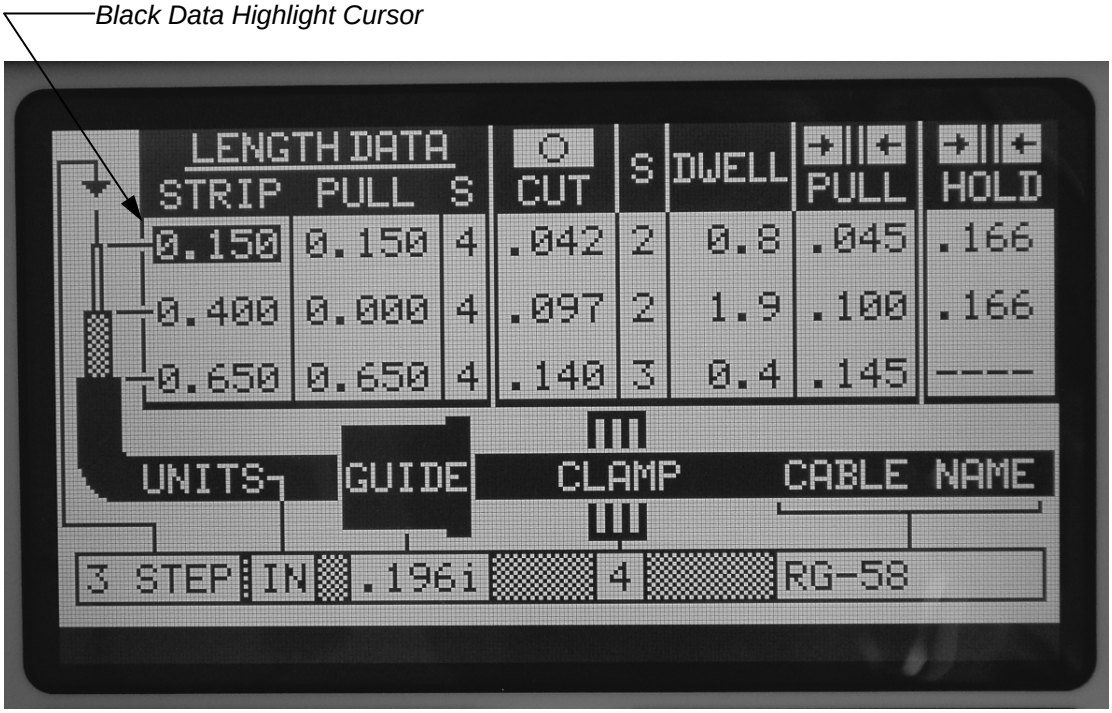

Figure 4-2 The CX-2000 "Edit Screen"

4.3.1 The Edit Screen Data Fields

Figure 4-3 below shows the Edit Screen with each of the various data fields or field groups called out by number. The description of each data field follows;

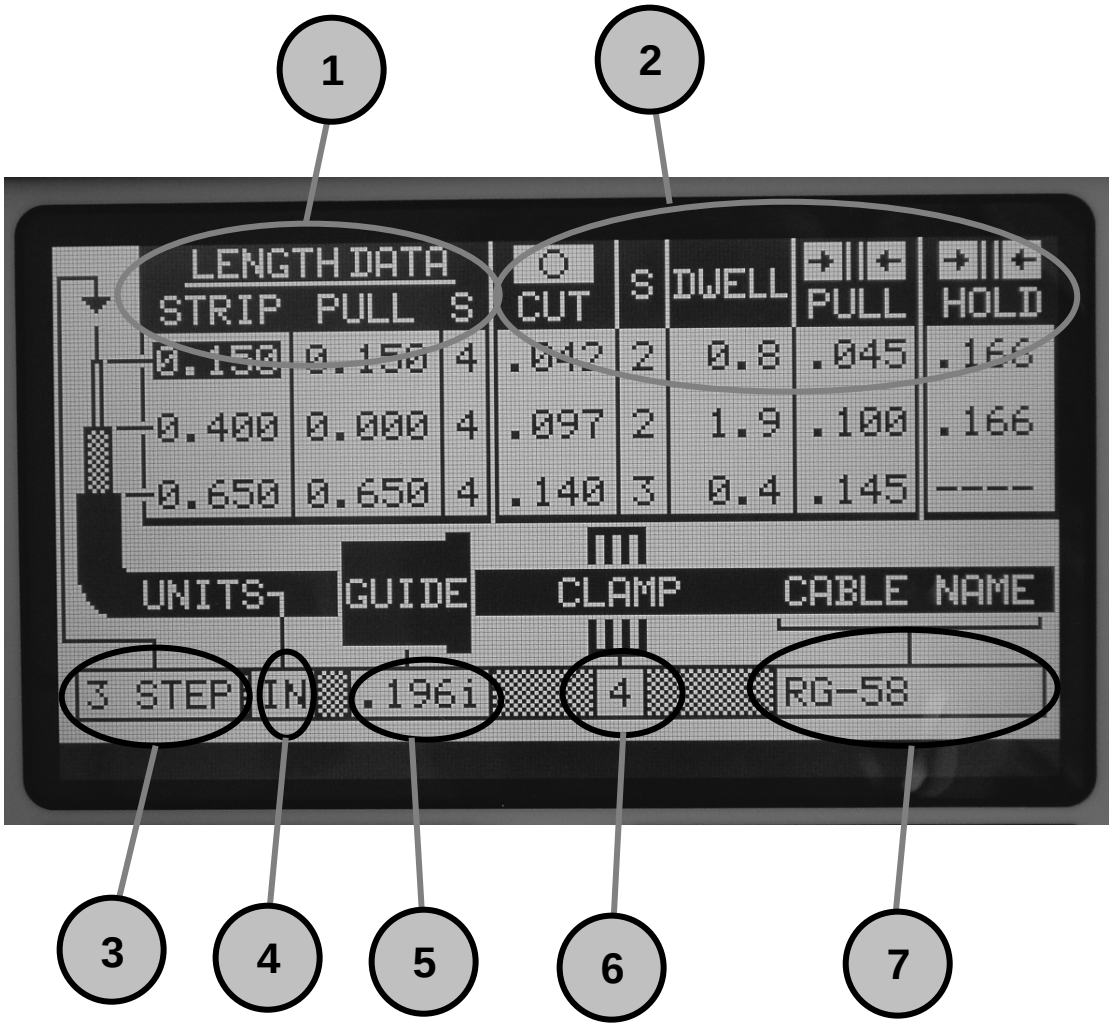

Figure 4-3 The CX-2000 "Edit Screen" Data Fields

1 The **LENGTH DATA** group contains three fields of information. To edit the data, highlight the desired data field by moving the black data highlight cursor over the field, using the four arrow keys. When the desired field is highlighted, enter the data using the number keys. If it is necessary to correct an entry, press the RESET key to clear the field, then re-enter the data. The function of each of these variables is described below;

- **STRIP** The length of the strip from the end of the cable to the step that corresponds to the line the data is on. (See pictorial of cable end at the left of the display. Each new row of data corresponds to the next step of the cable end strip.) The maximum value that can be entered for **STRIP** is 1.500" (38.10mm). "Data Line Move" function is also accessed by pressing the F1 key when this field is highlighted (see section 4.3.3 for more information on the "Data Line Move" function.)

- **PULL** The distance that the severed slug of insulation is pulled from the corresponding **STRIP** distance. If this value is equal to or greater than the **STRIP** distance, the slug will be pulled off completely (known as a full strip.) If it is less than the **STRIP** distance, it is considered a partial strip. The maximum value that can be entered is the corresponding **STRIP** distance plus .050" (1.27mm).

- **S** The speed at which the slug will be pulled. The minimum (slowest) value is 1, the maximum (fastest) value is 4.

2 The **DIAMETER DATA** group contains four fields of data. To edit the data, highlight the desired data field by moving the black data highlight cursor over the field, using the four arrow keys. When the desired field is highlighted, enter the data using the number keys. If it is necessary to correct an entry, press the RESET key to clear the field, then re-enter the data. The function of each of these variables is described below.

- **CUT** **ORBIT BLADE CUT DIAMETER** - This is the diameter to which the orbiting blade will cut. See the ***Tip*** below for more information relating to the interaction of the **CUT** parameter and the **DWELL** parameter. The range of values for **CUT** is .000" to .290" (0.00mm to 7.36mm). If the **CUT** value is set to zero, a complete cut-off of the cable will occur. This is useful if a clean, square-cut cable end is required.

  Pressing the F1 key while the **CUT** data field is active turns the orbiting blade for the current step "OFF", and *forces* the **HOLD** data position to the "ON" position. When the orbiting blade is "OFF" in any given step (indicated by a series of dashes(-) in the CUT data field), the cutting is done by the Gripper Blades *for that step only*. The **HOLD** value for that step is used as the Gripper Blade cut diameter for the step. See section **4.3.3.2** for more information on Gripper Blades Only Strip mode.

  Repeatedly pressing the F1 key while the **CUT** data field is highlighted, will alternately turn the orbiting blade "ON" or "OFF". Make sure when changing this field to the "OFF" position that the data programmed in the **HOLD** data field is correct. ***Note: At least one of either the CUT or HOLD data fields, or both, must be "ON" for each step of the strip sequence.***

- **S** **BLADE FEED RATE** - This value controls how fast the blade will feed in to the cut diameter as it is orbiting the cable. The slowest feed rate is 1, the fastest is 4. For the outer jacket cut on a typical cable, this value can usually be set to 3 or 4. For the center conductor and braid cuts, this value is usually set to 1 or 2, depending on the cable diameter, shield density and material, etc… Some experience is required to fully understand the effects the feed rate has on the strip operation.

- **DWELL** **BLADE DWELL TIME** - This is the amount of time, in seconds, that the blade will dwell and continue to orbit the cable after it has reached the programmed **CUT** value, before proceeding to the pull-off function. The minimum programmable value is 0.0 seconds. The maximum is 3.0 seconds.
  Some experience is required to fully understand the **DWELL** time parameter, the interaction of **DWELL** with other strip parameters and the effect on strip quality.

Optimal **DWELL** times vary depending upon the size of the cable being processed, the density of the dielectric and the thickness of the braided shield. Entering a longer **DWELL** value may give similar results as entering a slightly smaller **CUT** value. This is due to the compression / recovery characteristics of the cable, as the blade is fed through the layers to the cut diameter.

Typical **DWELL** values for a center conductor cut may be in the range of 0.5 – 1.5 seconds. Braid cuts (cutting through the braid and to the dielectric) usually require a longer **DWELL** time, typically in the range of 1.2 – 2.5 seconds. Outer jacket cuts usually require the least amount of **DWELL** time, usually 0.3 – 1.0 seconds is sufficient.

- **PULL** — **GRIPPER BLADE PULL DIAMETER** - This is the diameter that the Gripper Blades will move to during the slug removal ("pull-off" or "stripping") portion of the strip step. This is typically set to a value that is slightly larger than the **CUT** dimension to prevent "scraping" the cable during slug removal. This data is used when in Normal Mode or Gripper Blades Only Strip mode. The range of values for **PULL** is .000" to .290" (0.00mm to 7.36 mm). **Note: If the corresponding LENGTH DATA PULL value is zero (0.000), the PULL data field is ignored.**

- **HOLD** — **CABLE HOLD DIAMETER (Alternately used as CUT diameter when in Gripper Blades Only strip mode) –** For Normal Mode stripping (performing the cutting function with the orbiting blade) the gripper blades will close to the diameter programmed in this data field before the orbiting blade is activated for the given strip step, if this data field is turned "ON". It is designed to allow the Gripper Blades to "hold" the cable to help stabilize and prevent "whipping" of the cable end while the orbiting blade is severing the cable. This can be an aid when working with thin-layered, extra flexible, and other difficult-to strip cables.

  This feature can be alternately turned "ON" or "OFF" by pressing the F1 key while this data field is highlighted during editing of any given strip step. When this feature is turned "OFF" for a given step, the data field for the step displays a series of dashes(-). See 4.3.3.3 "Cable Hold Mode" for more information on this feature.

  An alternate use for this data field is as the CUT depth of the gripper blades when the strip step is set for Gripper Blades Only Strip mode (orbiting blade is turned "OFF"). When set for this mode, the **HOLD** data controls the diameter the gripper blades close to during the cut portion of the strip step, and the **PULL** data controls the diameter the gripper blades are positioned to during the slug removal (stripping) portion of the strip step.

  If this data field is set to "OFF" (indicated by a series of dashes being displayed in the data field), the **CUT** data field is automatically *forced* to the on position. Make sure when changing this field to the "OFF" position that the data programmed in the **CUT** data field is correct.

  See the section above detailing the **CUT** data parameter, and section **4.3.3.3** for more information on this data field.***Note: At least one of either the CUT or HOLD data fields, or both, must be "ON" for each step of the strip sequence.***

3

The **x STEP** field is used to set the number of stripping steps in a stripping cycle. The maximum number of steps is five. The minimum is one.

To set the number of steps, highlight the **x STEP** data field by moving the black data highlight cursor over the field, using the four arrow keys.

When the **x STEP** field is highlighted by the cursor, press ENTER . The CX-2000 GUI will display a graphic representation of the five possible **x STEP** options. See figure 4-4 below. To the left side of the display there will be a black arrow pointing to the currently selected number of steps.

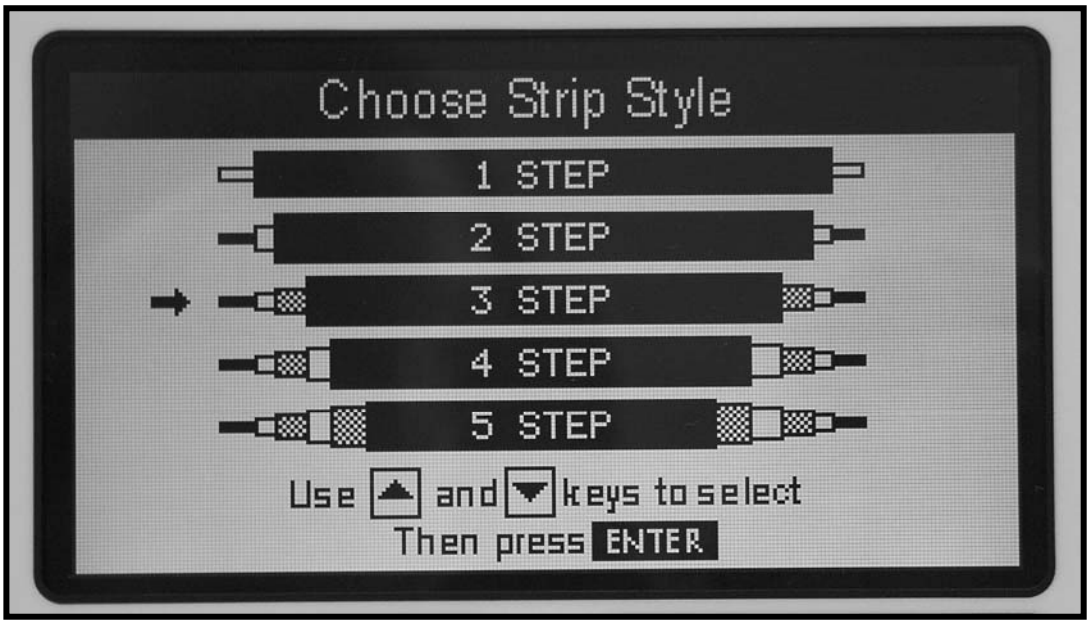

Figure 4-4 – CX-2000 Step Selection Screen

To select a different number of strip steps, point the black arrow to the desired selection by moving it using the ▲ or ▼ keys. When finished, press ENTER .The display will return to the “Edit Screen” and will be re-configured for the new number of steps selected.

4 The **UNITS** field allows the operator to set the programming units in Inches (displayed as **IN**) or Millimeters (**MM**). To edit, highlight the **UNITS** data field by moving the black data highlight cursor over the field, using the four arrow keys.

To toggle the selection, press RESET when the field is highlighted by the cursor. The data will be converted and re-displayed in the new **UNITS** format. It should be noted that the **GUIDE** data field (see below) unit of measure is programmed separately from the overall program unit of measure (**UNITS**) setting. This is due to the fact a metric sized guide bushing may be used for a cable setup in which the programming units is set to inches, or vice-versa.

When a program is recalled from memory, it will be recalled formatted with the **UNITS** in which it was stored.

5 The **GUIDE** field represents the size of the *Wire Guide Bushing*, that is the correct size for the cable being processed. The GUIDE field is programmed in inches or millimeters independently of the other data fields, as required.

To edit, highlight the **GUIDE** data field by moving the black data highlight cursor over the field, using the four arrow keys. When the field is highlighted by the cursor, enter *the Wire Guide Bushing* size using the number keys. The *Wire Guide Bushing* size can be found marked on its face. If it is necessary to correct an entry, press RESET to clear the field, then re-enter the correct data using the number keys. Pressing the F1 key will toggle the units between inches (i) and millimeters (m).

! Note It is important that the correct *Wire Guide Bushing* size be entered for each cable strip program entered. The CX-2000 uses the **GUIDE** information as setup information during Auto Calibration Mode. If the incorrect *Wire Guide Bushing* size is entered, the unit may not process cables correctly.

6 The **CLAMP** field controls the pressure applied to the cable by the clamp jaws during processing.

The range of values for the **CLAMP** field is 1– 9. 1 is the lowest clamp pressure and 9 is the highest. To edit the data, highlight the **CLAMP** data field by moving the black data highlight cursor over the field, using the four arrow keys. When the **CLAMP** field is highlighted, enter the value using the number keys. If it is necessary to correct an entry, simply type the new value over the incorrect entry.

To test the actual amount of pressure that will be applied to the cable during the strip cycle, insert a piece of the cable to be stripped into the clamp jaws. With the **CLAMP** value highlighted by the black data highlight cursor, press the F1 key. The clamp jaws will close on the cable, applying the programmed amount of force. Press the F1 key again to open the jaws. Use the arrow keys to accept the programmed value and move on to another field, or type a new value and re-test. Repeat this process until the desired force is set.

The *range* (span) of clamping force generated by **CLAMP** settings of 1 – 9 can be increased or decreased slightly if necessary by changing the **Clamp Force Gain** setting under the **Process Options** menu. See page 42 for more information on the **Clamp Force Gain** setting.

7 The **CABLE NAME** field allows the operator to enter an alpha-numeric name for the current program. This name can be up to ten characters in length and can include letters, numbers and spaces, as well the # , * , and – characters. On the “Run Screen”, this name is clearly displayed in the upper right portion of the display.

To edit, highlight the **CABLE NAME** data field by moving the black data highlight cursor over the field, using the four arrow keys. When the field is highlighted by the cursor, press the EDIT key. The black highlight cursor will be replaced by a single character underline cursor, and will be positioned at the first character in the name field.

The number entry keys also serve as letter or character entry keys. The letters or character(s) that each key control are printed on the key, beneath the keys number. Pressing any one of these keys will enter and display the keys main number character at the current cursor location. Subsequent depressions of the same key will enter and display the other characters controlled by that key in round-robin fashion.

As an example, pressing the number “1” key once will display the number “1” in the current cursor location. Pressing the “1” key again will display the letter “A”. Pressing it again will display the letter “B”. Pressing it for a fourth time will display the letter “C” and pressing it once more will again display the number “1” and so on.

When the correct character is displayed at the current cursor position, move the cursor to the next location by using the ◀ or ▶ keys, and enter the required character as above. Repeat this process until the correct name is displayed in the field.

If an error is made during data entry, simply type over the data with the correct data. To erase a single character or enter a space, highlight the character with the underline cursor and place a “SPACE” character in that location by pressing the zero (0) key twice. To erase the complete **CABLE NAME** field, press the RESET key.

When finished entering data in the **CABLE NAME** field, press the EDIT key. The black data highlight cursor will appear and normal editing of the other fields may resume.

4.3.2 Example – Entering a Cable Strip Program

The following is an example of the steps required to enter a cable strip program.

1) In this example, the cable that we are programming the strip operation for is an RG-58 type cable. The required strip specicifications are shown below in figure 4-5. See the individual sections above for additional data field programming information.

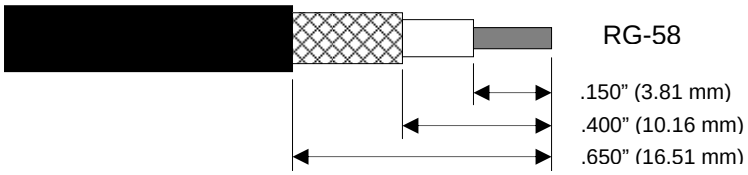

Figure 4-5 Sample Cable Specifications

2) The first step is to determine the correct *Wire Guide Bushing* size. Measuring the O.D. of the cable with a set of dial calipers, the average measurement is in the range of .190" - .192" (4.83 – 4.88 mm). Because there needs to be a minimal amount of clearance between the cable and *Wire Guide Bushing,* add .003. - .005" to the measured average cable diameter.

   In this example, we try a *Wire Guide Bushing* size of .196" by sliding it along a length of the cable. The bushing should slide freely along the length of the cable, but there should not be excessive side-to-side movement between the cable and the bushing. *The better fit the Wire Guide Bushing has to the cable O.D., the better the strip quality will be.* In this case, the .196" bushing is a good fit, so this is the size we will use.

3) Press the EDIT key. The CX-2000 will enter "Edit Mode" and the "Edit Screen" will be displayed, with the black data highlight cursor in the first STRIP LENGTH position.

4) If the number of steps shown is not correct, position the black data highlight cursor over the **STEP** field and press ENTER . The CX-2000 "Step Selection Screen" will be displayed. Point the arrow to the desired number of steps and press ENTER .

5) Next verify that the programming units (**IN** or **MM**) is set to **IN**. If not, position the black highlight cursor over the **UNITS** field and press RESET until **IN** is displayed. The display will be re-configured for inch units.

6) Position the black data highlight cursor over the **GUIDE** field, and enter the *Wire Guide Bushing* size as determined in Step 2 above (.196). The GUIDE field may be programmed in inches or millimeters independently of the other data fields by pressing the F1 key. Be sure the correct unit is selected.

7) Enter the clamp pressure value. See **(6) - CLAMP** in section 4.3.1.

8) Enter a cable name, if desired. See **(7) – CABLE NAME** in section 4.3.1.

9) Position the black data highlight cursor over the **STRIP** Length data field for the first step. As can be seen in figure 4.5 above, the first strip length should be .150". Enter 0.150 in the data field. (It is not necessary to enter leading zeros or decimal points. In this example, the operator would simply press 1 5 0. The leading zero and the decimal point are automatic.)

10) Move the black data highlight cursor one position to the right, over the **PULL** Length data field. A full strip is required. Enter 0.150 (press 1 5 0).

11) Move the black data highlight cursor one position to the right, over the **S** data field. Enter 3 for the pull speed.

4.3.2 Example – Entering a Cable Strip Program (cont.)

12) Next, move the black data highlight cursor one position to the right, over the **Orbit Blade Diameter (CUT)** data field. The center conductor measures .035" (.89 mm) with our dial calipers. Enter this in the **CUT** field.

13) Move the black data highlight cursor one position to the right, over the **S** data field. There are several layers to cut through to get down to the center conductor, so a slower blade feed rate is desirable. Enter 2 in this data field.

14) Move the black data highlight cursor one position to the right, over the **DWELL** data field. Enter 0 8 in this field. This will allow the cutter blade to dwell for 0.8 seconds after reching the programmed diameter. Refer to **DWELL** under (2) in section 4.3.1 for more information.

15) Move the black data highlight cursor one position to the right, over the **PULL Diameter** data field. The **PULL Diameter** value should be set slightly larger than the **CUT** value to prevent the Gripper Blades from scraping the cable when pulling the slug. We will set this value .005" larger than the **CUT** value. Enter 0 4 0 in this field.

16) Move the black data highlight cursor one position to the right, over the **HOLD** data field. For the center conductor strip we will use the Gripper Blades to stabilize the end of the cable while the orbiting blade is performing the cut operation. We want the Gripper Blades to have a good grip on the cable so we will program them to a HOLD Diameter of.030" smaller than the GUIDE value. Enter 1 6 6 in this field. If this field is turned OFF (indicated by a series of dashes (-) displayed in the field), press the F1 key to activate this field.

17) Repeat steps 9 – 16 above for strip Steps 2 and 3, using the following data:

	Step 2	Step 3
STRIP	**0.400**	**0.650**
PULL (length)	**0.000**	**0.650**
LENGTH S	**3**	**3**
CUT	**.115**	**.135**
CUT S	**1**	**2**
DWELL	**1.0**	**0.2**
PULL (dia.)	**.120**	**.140**
HOLD	**.166**	**---- (OFF)**

18) Notice that the **PULL Length** value for Step 2 is set to .000. It is common practice to set the **PULL Length** value for the dielectric cut to zero if the **PULL length** value of the next step is set for a full strip. In this example, the Step 3 **PULL length** value is set for a full strip. When the slug from Step 3 is pulled, it will also pull off the slug left in Step 2. This saves some time during the strip cycle.

19) The value entered in the **CUT** field of Step 2 is the diameter of the dielectric that is measured with the dial calipers. The measured diameter values of a cable are typically used as the initial programming values when setting up a strip program. They are however, seldom the optimum programmed values.

! Note

It is important to note that, due to the operating characteristics of an orbiting blade stripper, the final programmed cut diameters that give the desired strip quality may not correspond with the actual measured values of the cable. This is quite normal and not a sign that there is a problem with the CX-2000.

This is especially true in the case of dielectric strips, where the optimum programmed **CUT** value is typically less than the actual measured diameter of the dielectric.

4.3.2 Example – Entering a Cable Strip Program (cont.)

20) After entering all of the required data as above, press ENTER The "Run Screen" will be displayed and the unit is ready to process cables.

21) Perform a test strip (see Section 3 – Processing Cables).

22) Check the strip quality and make any necessary changes by entering "Edit Mode" as in Step 3 above, and editing the required data fields.

23) For the example described here, the table below shows the final programming data that produced the optimum strip. Notice the differences from our originally programmed values (Figure 4-6) and our optimum values (Figure 4-7). Changed values are highlighted in Figure 4-7.

Figure 4-6 RG-58 - Example Starting Data Values

	Step 1	Step 2	Step 3
STRIP	0.150	0.400	0.650
PULL (length)	0.150	0.000	0.650
LENGTH S	3	3	3
CUT	.035	.115	.135
CUT S	2	1	4
DWELL	0.8	1.0	0.2
PULL (dia)	.040	.120	.140
HOLD	.166	.166	---- (OFF)

Figure 4-7 RG-58 Example - Optimum Programmed Values

	Step 1	Step 2	Step 3
STRIP	0.150	0.400	0.650
PULL (length)	0.150	0.000	0.650
LENGTH S	3	3	3
CUT	.040	.110	.140
CUT S	2	1	4
DWELL	0.8	1.9	0.4
PULL (dia.)	.045	.120	.145
HOLD	.166	.166	---- (OFF)

4.3.3 Edit Mode – Special Function Programming

In order to offer a high degree of flexibility in the range of wire and cable types that can be processed on the CX-2000, there are several special software features available to an operator when programming the CX-2000. This section highlights these special functions, their use and programming. The CX-2000 "Special Functions" include :

"Data Line Move" function allows an operator easily change the stripping sequence of the CX-2000 by moving a complete line of data up or down, without having to reprogram each data field individually.

"Gripper Blades Only Strip Mode" function allows an operator to program the CX-2000 to use only the Gripper Blades to perform the "strip" for a given step in the stripping sequence.

"Cable Hold Mode" function allows the operator to selectively choose to hold the cable with the Gripper Blades before the orbiting blade is brought into contact with the cable, for each step in the strip sequence.

4.3.3.1 Special Function Programming – "Data Line Move" function

The normal sequence of strip steps that the CX-2000 is programmed for is generally :

Step 1 - Expose center conductor

Step 2 - Expose dielectric

Step 3 - Expose shield

Step 4 - Expose 2nd dielectric (triax cables)

Step 5 - Expose 2nd shield (triax cables)

In certain instances after initially programming a conventional strip sequence as shown above, it may be advantageous to "switch" the steps that the CX-2000 performs.

This is desirable for example, when the amount of exposed dielectric is very small and it is determined that a better strip can be achieved by exposing the dielectric on the first step and exposing the center conductor on the second step.

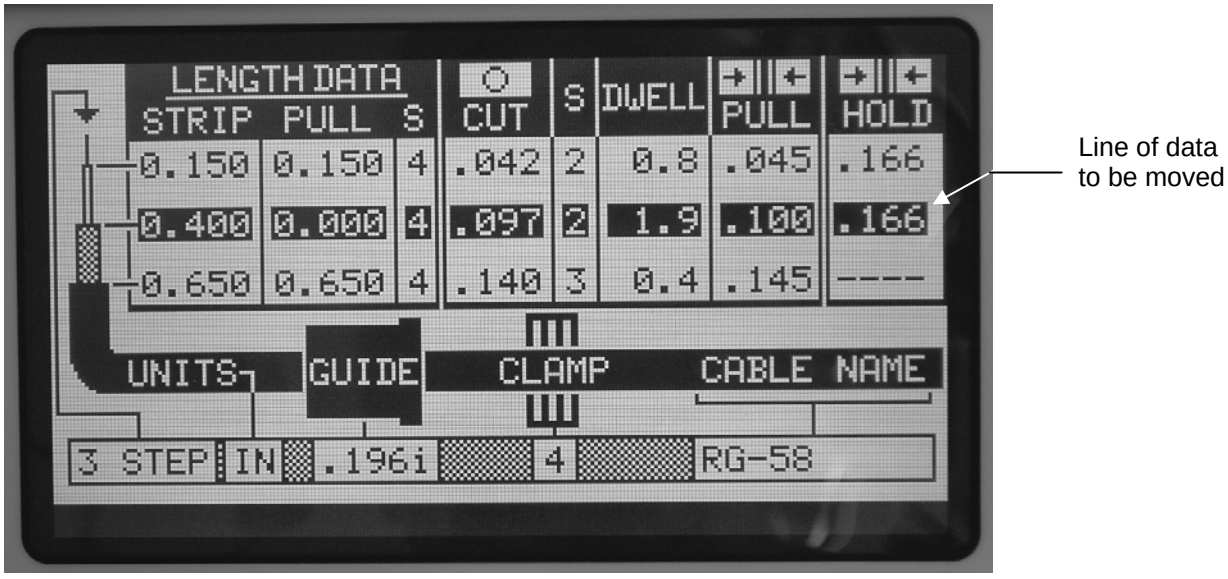

Figure 4-8 "Data Line Move" Highlight Cursor

Rather than manually reprogramming all of the fields of the two or more lines of data involved, the "Data Line Move" feature of the CX-2000 can be employed. This feature allows the operator to highlight an entire line of data and move that line of data up or down to the desired step. The other lines of data will "switch places" accordingly.

To use this feature, while in "Edit Mode" move the black data highlight cursor over the first field (STRIP LENGTH) of the line of data to be moved, and press the F1 key. The entire line of data will be highlighted. See figure 4-8.

Pressing the ▲ or ▼ key while the line of data is highlighted will move the entire line of data up or down one line at a time. If it is desired to move the data more than one line, repeatedly pressing the ▲ or the ▼ key will continue to move the data one line at a time. When the data is located in the desired step location, pressing the ENTER key ends "Data Line Move" function and normal editing mode is resumed.

4.3.3.2 Special Function Programming – "Gripper Blades Only Strip Mode"

The "Gripper Blades Only Strip Mode" function allows an operator to program the CX-2000 to use only the Gripper Blades to perform the strip for a given step in the stripping sequence. Any individual strip step can be programmed in this mode, independent of the other steps in the stripping sequence.

In this mode the orbiting blade is not actuated during the strip step. It is simply moved to its full open position in order to clear the cable. The value programmed in **HOLD** becomes the active stripping diameter. During the stripping sequence, the DIAMETER "S" parameter is not used since the gripper blades operate at a fixed speed. The **DWELL** and **PULL** parameters are used as described in 2, but in conjunction with the Gripper Blades rather than the Orbiting Blade. In operation, the Gripper Blades are positioned at the programmed **STRIP length**, and closed to the programmed **HOLD** diameter. The blades then dwell the amount of time programmed in **DWELL**, move to the diameter programmed in **PULL**, and the slug is pulled the amount programmed in **PULL** length.

This feature allows the just the Gripper Blades to be used to strip, for example hookup wire, when the job does not demand severing the jacket around the entire circumference of the wire. This speeds up the single step stripping operation.

This feature is also useful when it is desirable to leave the center conductor "slug" on a coax to prevent fraying of the strands during cable handling. Using this feature an operator can program the CX-2000 to perform the center conductor cut on the first step, leaving enough material uncut to prevent subsequent pull operations from inadvertantly removing the slug. The fourth step can then be programmed to partially pull the slug using just the gripper blades.

To program the "Gripper Blades Only" function of the CX-2000:

1) Enter the desired LENGTH "STRIP" and LENGTH "PULL" and LENGTH "S" information for the step to be stripped using only the gripper blades.

2) Highlight the **CUT** data field with the black data highlight cursor, then press the F1 Key. The value in the **CUT** data field will be replaced with a dashed line. See figure 4-9. This dashed line indicates that the step is programmed for "Gripper Blades Only" mode. Any data originally contained in the field will be ignored.

3) Enter the desired values in the DIAMETER "DWELL" and DIAMETER "PULL" data fields.

4) In the **HOLD** data field, enter the diameter to which the gripper blades should close to perform the CUT.

When this step is executed during the stripping sequence, the Gripper Blades will be positioned at the location programmed in **STRIP length**, the Gripper Blades will close to the value programmed in **HOLD** and dwell the amount of time programmed in **DWELL**, move to the diameter programmed in **PULL**, and the severed slug will be pulled the amount programmed in **PULL length.**

See the section detailing the **CUT** data parameter and the **HOLD** data parameter for more information on this data field.

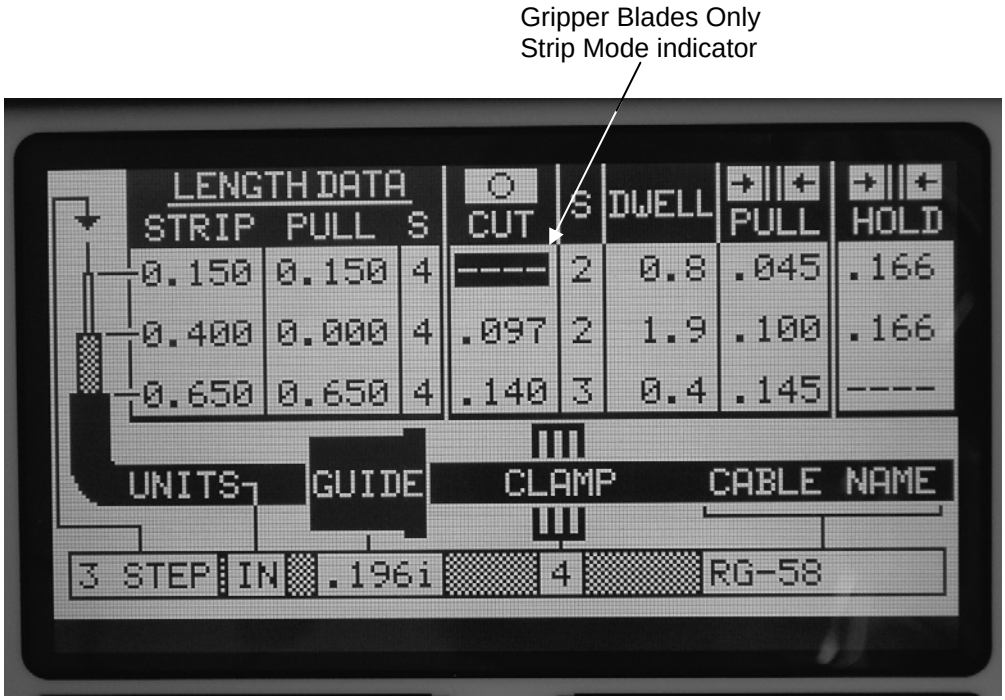

Figure 4-9 "Gripper Blades Only Programming Mode" example (notice dashed line)

4.3.3.3 Special Function Programming – "Cable Hold Mode"

The "Cable Hold Mode" function allows the operator to selectively program the Gripper Blades to "hold" the cable during each strip step to help stabilize and prevent "whipping" of the cable end while the orbiting blade is severing the cable. In this mode, the gripper blades offer support and stability to the cable, in addition to the wire guide, when the orbiting blade is performing its cutting operation.This can be an aid when working with thin-layered, extra flexible, and other difficult-to strip cables.

"Cable Hold Mode" is individually programmed for each step of the strip sequence, independent of the other strips in the sequence. This feature can be alternately turned "ON" or "OFF" by pressing the F1 key while this data field is highlighted during editing of any given strip step. When this feature is turned "OFF" for a given step, the data field for the step displays a series of dashes(-). See figure 4-10.

To activate this mode for any step in the stripping sequence programmed for Normal mode (orbiting blade "ON"), while in EDIT mode move the black data highlight cursor over the **HOLD** data field for the desired step. If the **HOLD** data field is "OFF", turn it on by pressing the F1 key. Next, enter the desired **HOLD** value if not already present.

An alternate use for this data field is as the CUT depth of the gripper blades when the strip step is set for Gripper Blades Only Strip mode (orbiting blade is turned "OFF"). When set for this mode, the **HOLD** data controls the diameter the gripper blades close to during the cut portion of the strip step, and the **PULL** data controls the diameter the gripper blades are positioned to during the slug removal ("pull-off" or "stripping") portion of the strip step.

If this data field is set to "OFF" (indicated by a series of dashes being displayed in the data field), the **CUT** data field is automatically *forced* to the on position. Make sure when changing this field to the "OFF" position that the data programmed in the **CUT** data field is correct.

See the section detailing the **CUT** data parameter and the **HOLD** data parameter, and section **4.3.3.2** Gripper Blades Only Strip mode above, for more information on this data field. ***Note: At least one of either the CUT or HOLD data fields, or both, must be "ON" for each step of the strip sequence.***

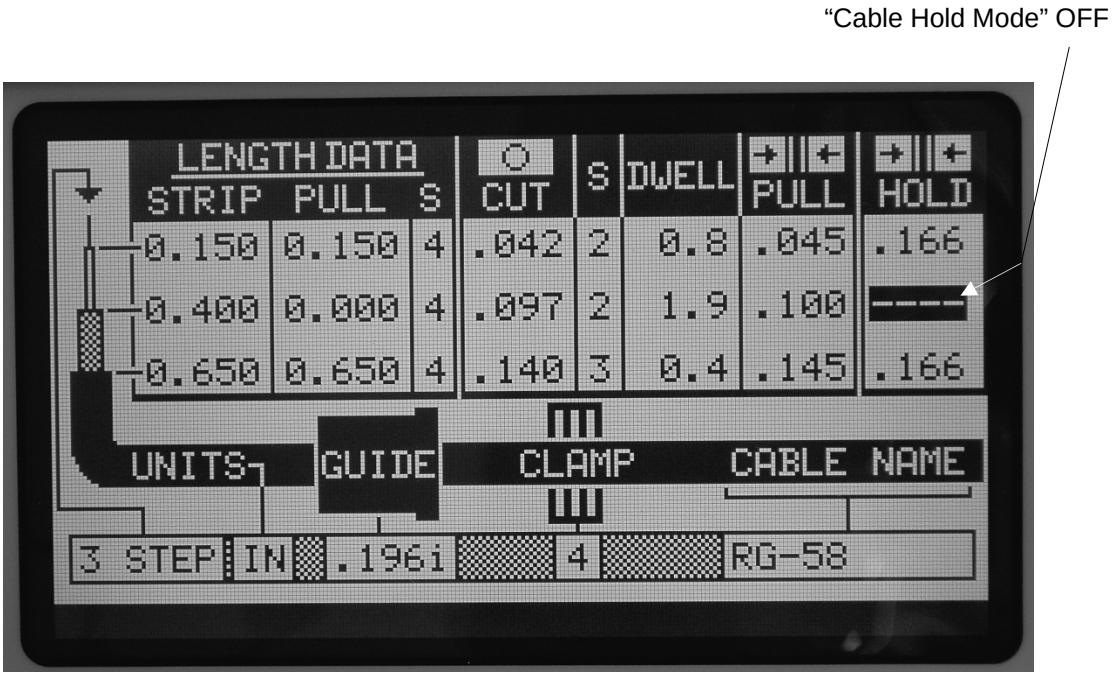

Figure 4-10 "Cable Hold Mode" programming example

4.4 Menu Mode – The MENU *Key*

Pressing the MENU key accesses the CX-2000 "CONFIGURATION MENU". See figure 4-11. From this menu an operator can edit the CX-2000 PROCESS OPTIONS. These include the Clamp Offset Force, the Cycle Completion Mode and Auto Completion Mode Dwell Time and the Pull Offset Distance. BLADE CHANGE Mode is also accessed from this menu, along with the user programmable PASSWORD SETUP. The RESERVED options are for factory use only.

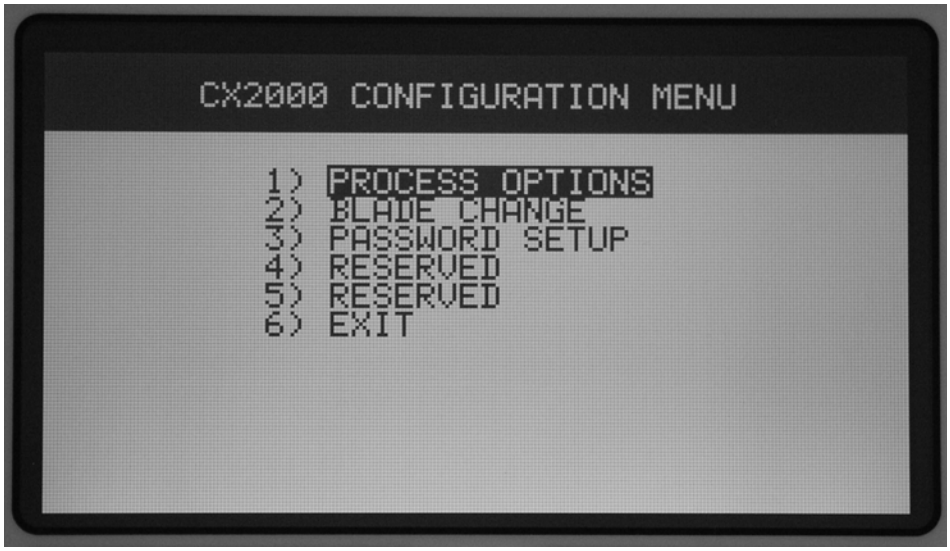

Figure 4-11 The CX-2000 Configuration Menu

4.4.1 Process Options

To edit the CX-2000 PROCESS OPTIONS, position the black data highlight cursor over "PROCESS OPTIONS" on the CX-2000 Configuration Menu as shown in Figure 4-11 above, and press the ENTER key. The CX-2000 "PROCESS OPTIONS" menu will be displayed as shown in figure 4-12. The following paragraphs detail each of the available user programmable PROCESS OPTIONS.

1) Clamp Force Gain

The **CLAMP FORCE GAIN** increases (or decreases) the range of force generated by the **CLAMP** settings 1 – 9 (see page 33 for more information on the CLAMP setting). The factory default value is determined during initial factory setup, and can vary slightly from machine to machine. Pressing the **CLEAR** key when this value is highlighted by the black data highlight cursor, will automatically recall the default value for your machine. The possible range of values for this setting is 1 – 25.

The default value set by the factory is chosen to offer an adequate range of clamp force for a wide range of cable types and sizes, simply by choosing a **CLAMP** value in the range of 1 – 9 (see page 33) during cable strip programming.

Occasionally however, it may be desirable to increase or reduce the **Clamp Force Gain** setting slightly from the default setting. As an example, if it is impossible to prevent the clamp jaws from deforming the cable, even with a **CLAMP** setting of 1. In this example, it would be desirable to reduce the **Clamp Force Gain** setting. Another example, if it is impossible to hold the cable tight enough to prevent it from slipping through the jaws during the stripping operation with a **CLAMP** setting of 9. In this example we would increase the **Clamp Force Gain** setting slightly.

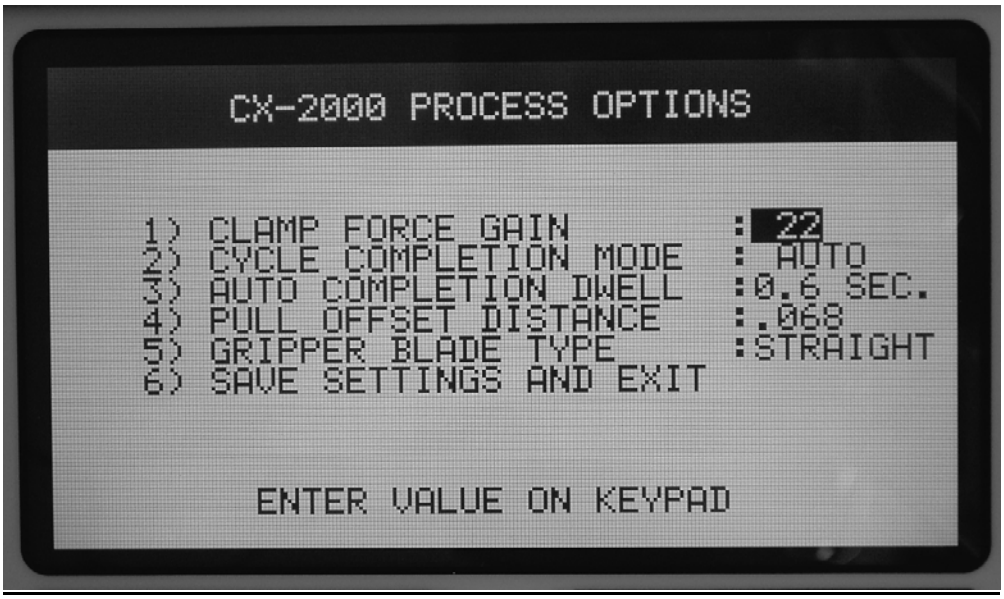
CX-2000 PROCESS OPTIONS
1) CLAMP FORCE GAIN : 22
2) CYCLE COMPLETION MODE : AUTO
3) AUTO COMPLETION DWELL :0.6 SEC.
4) PULL OFFSET DISTANCE :.068
5) GRIPPER BLADE TYPE :STRAIGHT
6) SAVE SETTINGS AND EXIT
ENTER VALUE ON KEYPAD

Figure 4-12 The CX-2000 Process Options Menu

2) Cycle Completion Mode Option

The CX-2000 "*Cycle Completion"* is the end portion of the strip cycle when the clamp jaws open, the operator removes the stripped cable, the clamp jaws reset and the cutter blade returns to its full closed position, readying the unit for the next strip cycle. There are two modes available, **AUTO** and **MANUAL**.

In **AUTO** mode, the clamp jaws open and the operator has a programmable amount of time (see **AUTO COMPLETION DWELL** in the next section) to remove the cable from the unit before the jaws reset and the cutter blade returns to its closed position.

Sometimes it is desirable to have the cutter blade close when directed by the operator, rather than automatically. This is especially true for new operators learning how to use the CX-2000, that do not quite have the strip cycle timing or "routine" mastered.

This is also desirable when stripping certain types of cables whose jacket strip portions have a tendency of getting trapped in the end of the wire guide bushing, or when processing semi-rigid or conformable type cables. The **MANUAL** mode should be selected in these instances. This mode gives an operator as much time as required to make sure the end of the wire guide bushing is free of debris before the cutter blade closes.

2) Cycle Completion Mode Option (cont.)

MANUAL mode requires the operator to press and release the **Run/Stop** switch after the clamp jaws open at the end of a strip cycle, resetting the unit for the next cycle. A beeping sound and a message on the LCD display will "remind" the operator to press the **Run/Stop** switch to complete the cycle.

To select the desired Cycle Completion Mode, position the black data highlight cursor over the **CYCLE COMPLETION MODE** data field and press the RESET key to toggle between **MANUAL** and **AUTO**.

3) Auto Completion Dwell Option

The **AUTO COMPLETION DWELL** option allows an operator to set the amount of time the CX-2000 waits after the clamp jaws open, before returning the cutter blade to its home (closed) position when **CYCLE COMPLETION MODE** is set **to AUTO.** This dwell can be set between 0.1 and 2.5 seconds.

To set the Auto Completion Dwell, position the black data highlight cursor over the **AUTO COMPLETION DWELL** data field and enter the desired value with the number keys.

4) Pull Offset Distance Option

The **PULL OFFSET DISTANCE** option allows the operator to set the distance that the gripper blades index forward to position them correctly for the slug removal (pull-off) portion of the strip cycle.

The **PULL OFFSET DISTANCE** is set at the factory during initial setup of the machine, to a distance that will close the gripper blades at the same point along the cable that the cutter blade severs the cable.

Note: In normal operation, the factory setting for the PULL OFFSET DISTANCE option should be acceptable for most applications, and adjustment of this parameter is not recommended.

5) Gripper Blade Type

This setting is not user adjustable on this Model.

6) Save Settings and Exit

When done setting the Process Options, position the black data highlight cursor over the **SAVE SETTINGS AND EXIT** option and press ENTER to save the settings and return to the CONFIGURATION MENU.

4.4.2 Blade Change

When installing a new cutter blade or gripper blades on the CX-2000, this option is selected by highlighting it with the black data highlight cursor and pressing the ENTER key. See *Section 3.4 Cutter Blade Replacement* for more information on this selection.

4.4.3 Password Setup

The CX-2000 offers a programmable security password function. The password is fully programmable up to 6 digits in length. When the Password is set to ON, the CX-2000 requires the operator to enter the correct Password to gain access to Edit Mode, Menu Mode, or Batch Mode. Recall and List options of Memory Mode can be accessed without the password, but Store and Erase functions will require the correct password to be entered. If an incorrect password is entered, the CX-2000 will display an error message and prompt the operator to press ENTER to return to the Run Screen.

The password can be turned ON or OFF or changed by positioning the black data highlight cursor over **PASSWORD SETUP** on the CX-2000 Configuration Menu, and pressing ENTER. The CX-2000 will require the operator to enter the current password to gain access to the **PASSWORD SETUP** menu. For extra security when entering the password, the CX-2000 will display an "X" in place of each character entered. See figure 4-13 below. **The CX-2000 Password is set to 0 (zero) when shipped from the factory.**

Figure 4-13 CX-2000 Password Request Screen

4.4.3 Password Setup (cont.)

If the correct password is entered, the CX-2000 will display the **PASSWORD SETUP** menu. See figure 4-14. To turn the Password ON or OFF, position the black data highlight cursor over the "**PASSWORD IS CURRENTLY :"** data field and press RESET to toggle the selection **ON** or **OFF**.

Figure 4-14 CX-2000 Password Setup Menu

To program a new password, position the black data highlight cursor over the **"STORE A NEW PASSWORD :"** data field and enter the new password with the number keys. If an error is made, press RESET to clear the data and start over.

When finished editing the **PASSWORD SETUP**, position the black data highlight cursor over "**EXIT PASSWORD SETUP"** and press ENTER to save the changes and return to the CX-2000 CONFIGURATION MENU.

4.4.4 Reserved

The **RESERVED** selections are for factory use only and may not be accessed by an operator.

4.5 Memory Mode – The MEMORY *Key*

The CX-2000 contains a battery-backed user program memory capable of storing up to 999 user programs (cable strip data) for easy future recall and re-use. Memory Mode allows an operator to RECALL or STORE programs, or ERASE memory locations, with a few keystrokes. The CX-2000 will alert an operator if a program location is empty when in RECALL mode, or if a memory location is already used when in STORE mode. A memory LIST function is also included which allows an operator to list the active memory locations showing Program Number and Cable Name. The operator can easily recall programs directly from this list.

To enter Memory Mode, press the MEMORY key when the CX-2000 Run Screen is displayed. Upon entering Memory Mode, the CX-2000 will display the Memory Functions screen and **RECALL** will be highlighted. See figure 4-15.

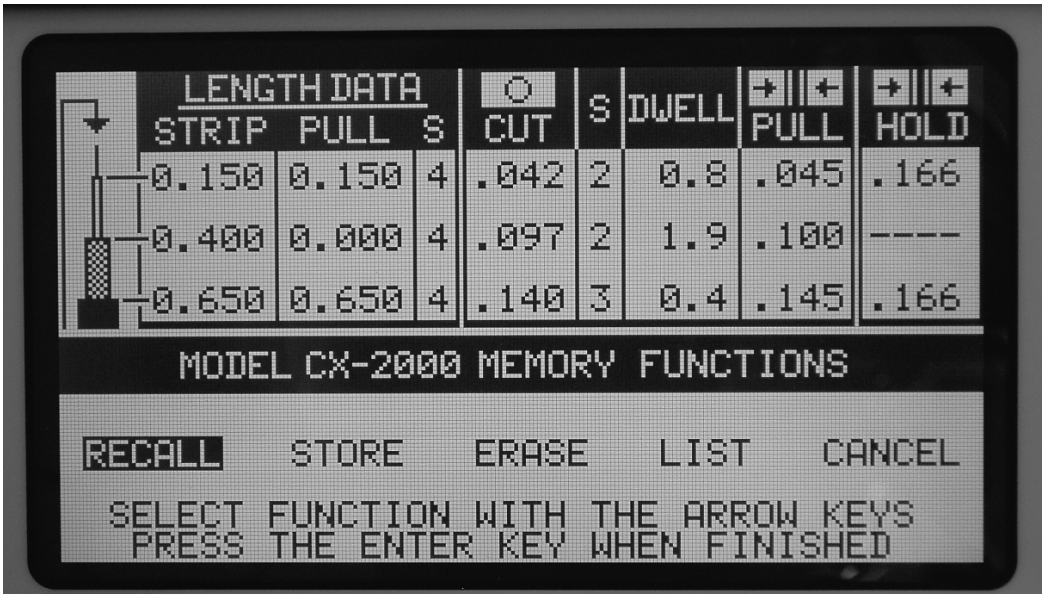

Figure 4-15 CX-2000 Memory Functions Screen

4.5.1 Memory RECALL Mode

To **RECALL** a previously stored cable program, press ENTER when **RECALL** is highlighted. The CX-2000 will prompt the operator for the Memory Number to recall, and the current memory number will be displayed. See figure 4-16.

Enter the desired Memory Number with the number keys. If an error is made during number entry, pressing RESET will clear the field and allow re-entry of the number. Press ENTER when finished.

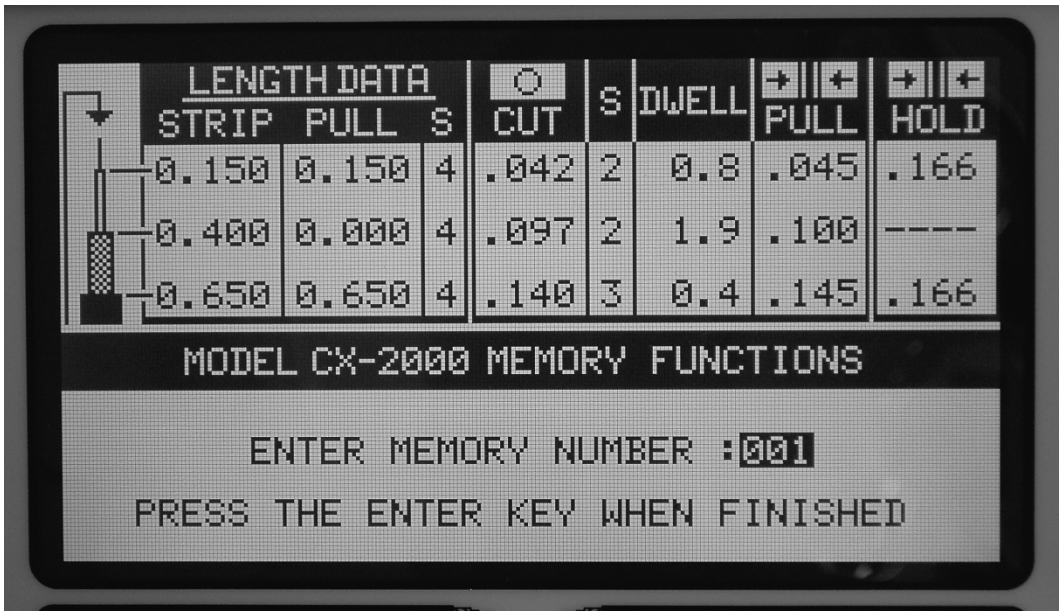

Figure 4-16 CX-2000 Memory Number Entry Screen

If the Memory Number entered contains a cable program, the CX-2000 recalls the setup data into the run memory and this data is displayed on the Run Screen and processing of cables can begin.

Note: Always verify that the correct Wire Guide Bushing is installed before attempting to process cables with new strip data!

If the Memory Number entered is empty, the CX-2000 will notify the operator that the memory location is unused.

4.5.2 Memory STORE Mode

To **STORE** the current program (the strip data displayed on the Run Screen) to a memory location, press the MEMORY key and position the black data highlight cursor over **STORE** and press the ENTER key. The CX-2000 will prompt the operator for the Memory Number to store the data in, and the current memory number will be displayed as in figure 4-15.

To save the data in the current memory location displayed, simply press the ENTER key. If a different memory location is to be used, enter the desired Memory Number with the number keys. If an error is made during number entry, pressing RESET will clear the field and allow re-entry of the number. Press ENTER when finished.

If the Memory Number entered is currently used, the CX-2000 will prompt the operator to choose if the memory location should be overwritten. See figure 4-17. If it is desired to store the new data in this location, position the black data highlight cursor over **YES** and press ENTER .

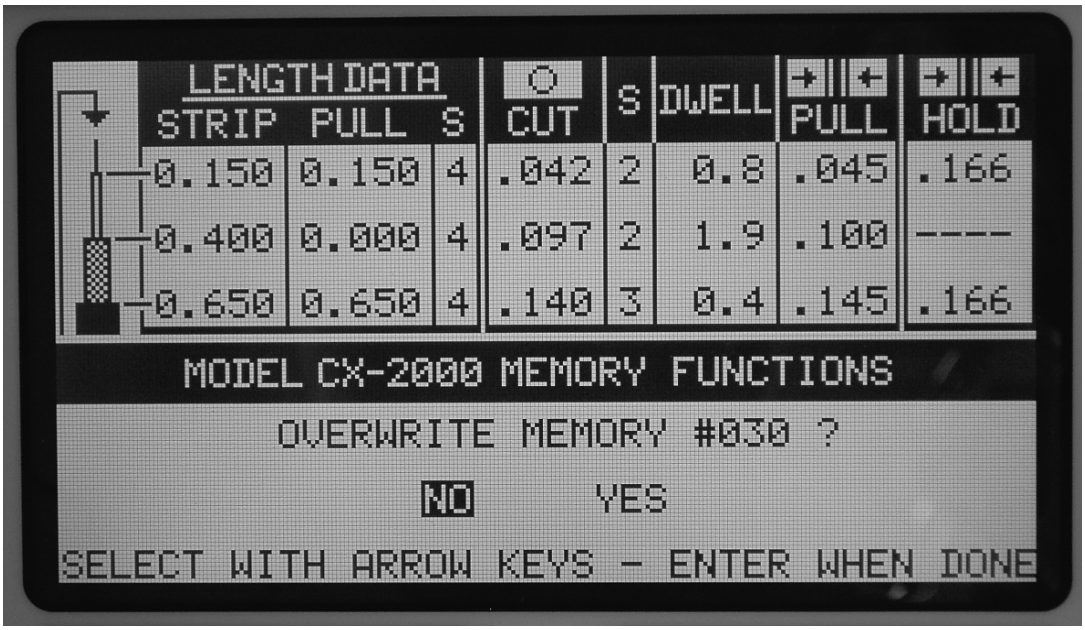

Figure 4-17 CX-2000 Memory Overwrite Prompt Screen

If **NO** is selected, the cable data ***will not*** be stored, and the CX-2000 will return to the Run Mode. To store the data to a different Memory Number, repeat the steps above.

When a program has been stored to a memory location, the CX-2000 will display a message indicating the program was successfully stored, and prompt the operator to press ENTER . See figure 4-18. The CX-2000 will return to Run Mode and processing can resume.

4.5.2 Memory STORE Mode (cont.)

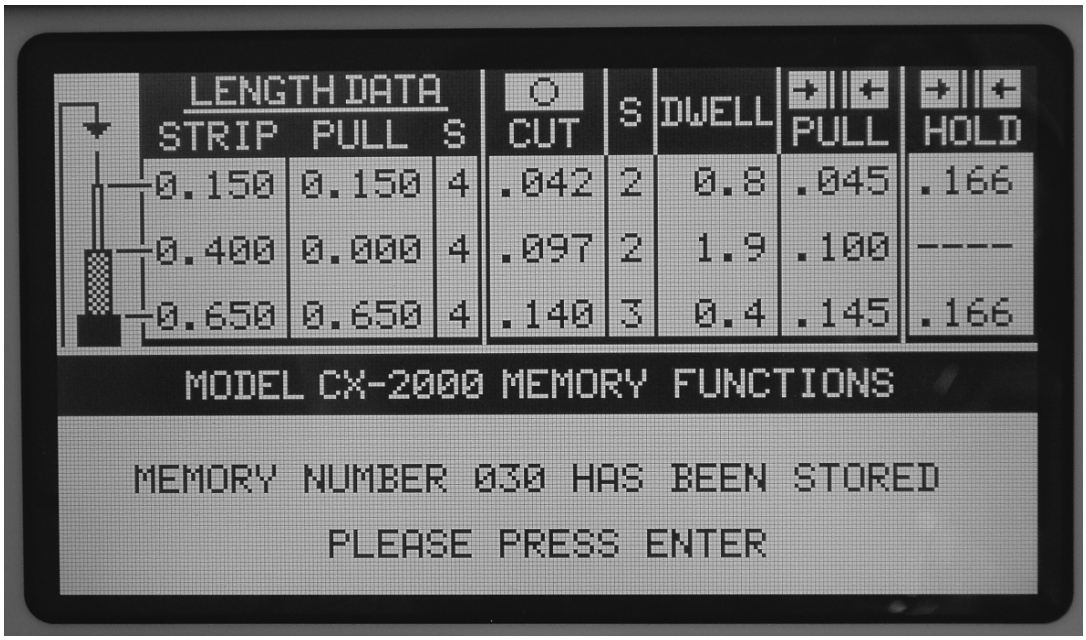

Figure 4-18 CX-2000 Memory Stored Screen

4.5.3 Memory ERASE Mode

Occasionally it is desirable to completely erase a memory location. This prevents unwanted data from being displayed when viewing the wire LIST, and removes the possibility of an operator recalling a cable program that is obsolete.

To **ERASE** a memory location, press the MEMORY key and position the black data highlight cursor over **ERASE**, then press the ENTER key. The CX-2000 will prompt the operator for the Memory Number to erase, and the current memory number will be displayed as in figure 4-15.

To erase the data in the current memory location displayed, simply press the ENTER key. If a different memory location is to be erased, enter the desired Memory Number with the number keys. If an error is made during number entry, pressing RESET will clear the field and allow re-entry of the number. Press ENTER when finished.

The CX-2000 will prompt the operator to confirm if the Memory Number should be erased. See figure 4-19. To ERASE the memory location, position the black data highlight cursor over **YES** and press the ENTER key. The CX-2000 will display a message that the selected Memory Number has been erased and prompt the operator to press ENTER. To cancel the ERASE operation, highlight **NO** and press the ENTER key.

It is important to note that once **YES** has been highlighted and ENTER has been pressed, the memory location will be completely erased and the data will not be recoverable.

4.5.3 Memory ERASE Mode (cont.)

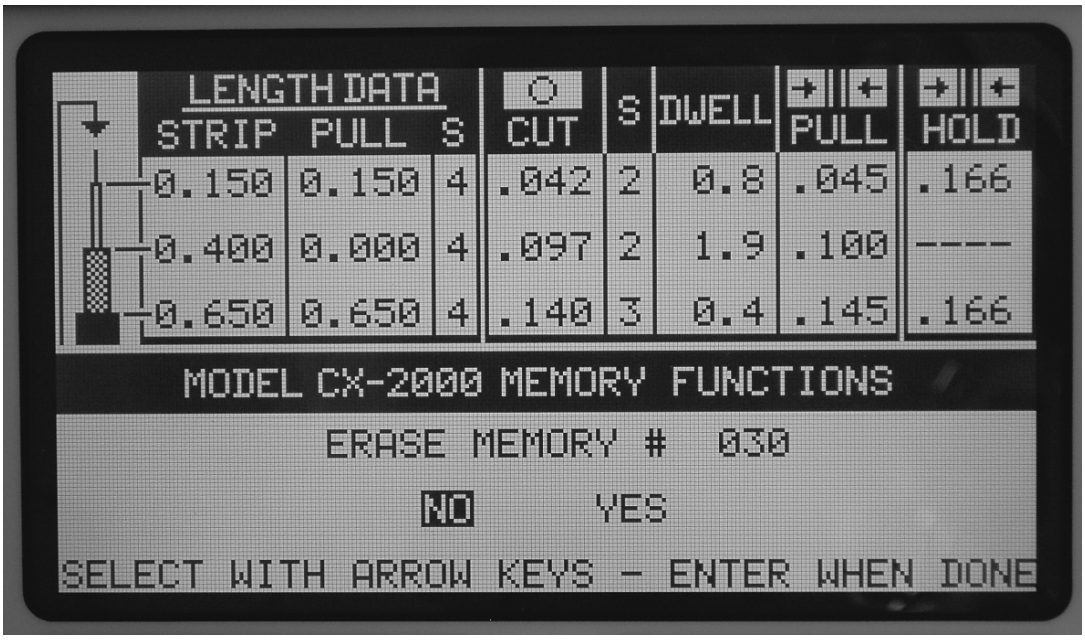

Figure 4-19 CX-2000 Memory Erase Confirmation Screen

4.5.4 Memory LIST Mode

To view the programs stored in the memory in list form, press the MEMORY key and position the black data highlight cursor over **LIST,** then press the ENTER key. The CX-2000 will display a list of all active memory locations, displaying the Program Number (MEM#) and the NAME as entered in the Cable Name field of each displayed Program Number. See figure 4-20.

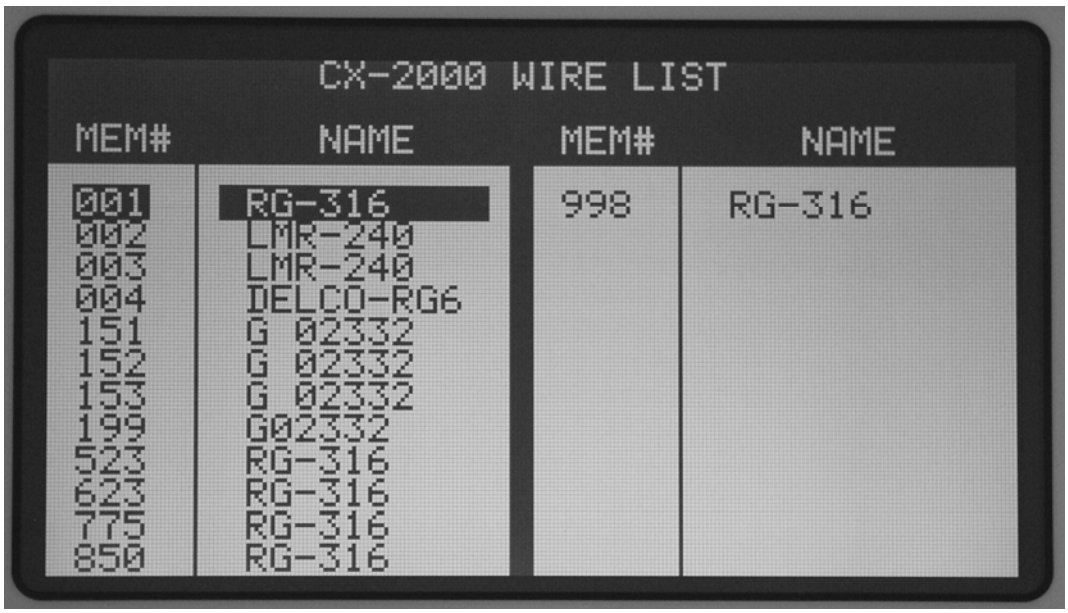

Figure 4-20 CX-2000 Memory Wire List Screen

4.5.4 Memory LIST Mode (cont.)

The list consists of a “page” or multiple “pages” of up to 24 memory locations per page. The list pages will contain only those Memory Numbers that contain an active program. There will be a black data highlight cursor highlighting one of the memory locations on the page.

To recall a Memory Number from the list, position the black data highlight cursor over the desired Memory Number using the keys, and press the key. The selected Memory Number will be recalled and become the active program.

If the desired Memory Number is not displayed on the current page, use the and keys to go to the next or previous pages until the desired Memory Number is displayed on the current page.

Pressing the key will exit the **LIST** function without recalling a program.

4.6 Batch Mode – The COUNTER *Key*

There are two modes of operation available on the CX-2000, *Normal Mode* and *Batch Mode*. *Normal Mode* is active when the value in **BATCH SIZE** equals one (1). Whenever **BATCH SIZE** is set greater than one, *Batch Mode* is active. The CX-2000 Batch Mode offers a batch counting feature with separate **"AMOUNT DONE"** and **"TOTAL DONE"** counters. Both counters are separately re-settable to a zero count or pre-settable to any amount.

The active mode is set by pressing the COUNTER key and positioning the black data highlight cursor over the **BATCH SIZE** data field and entering the desired value. The values in **AMOUNT DONE** and **TOTAL DONE** can also be edited at this time by positioning the cursor over the desired field and pressing RESET to zero the counter, or by presetting a new value with the number keys. Press the ENTER key when finished to return to Run Mode.

The following paragraphs describe the two modes of operation, and the use of the **AMOUNT DONE** and **TOTAL DONE** counters, in more detail.

4.6.1 Normal Mode

When the CX-2000 is used in Normal Mode (Batch Size = 1) the function of both the **AMOUNT DONE** and **TOTAL DONE** counters is essentially the same. Each one will increment once every complete strip cycle. Since both counters are independently pre-settable, their use is flexible.

For example, the **TOTAL DONE** counter could be used to keep track of the total amount of cable ends processed in a day, while the **AMOUNT DONE** counter could be reset to zero at the start of each shift, to track shift totals.

4.6.2 Batch Mode

When the CX-2000 is set for Batch Mode (Batch Size > 1) the **AMOUNT DONE** counter is used to track the amount of pieces completed in the current batch, while the **TOTAL DONE** counter tracks the total number of pieces processed since it was last reset to zero.

At the end of a batch, the CX-2000 will alert the operator that the batch is complete by displaying a message on the LCD display. It will also emit a beeping sound, and request that the operator press ENTER .

After pressing enter, the CX-2000 will return to Run Mode, the Run Screen will be displayed, the **AMOUNT DONE** counter will be reset to zero and a new batch of (**BATCH SIZE**) will begin. The CX-2000 will continue to run in Batch Mode until **BATCH SIZE** is set to a value of one (1).

4.6.2 Batch Mode (cont.)

For example, suppose an operator is required to process cables with one stripped end, and package them for shipping. The cables must be packaged in quantities of 100. The CX-2000 *Batch Mode* makes this an easy task. At the start of processing, the operator resets the **AMOUNT DONE** and **TOTAL DONE** counters to zero and enters a value of 100 in **BATCH SIZE**. After every 100 cycles, the CX-2000 alerts the operator that 100 pieces have been processed. The operator packages those cables and repeats the process as necessary. At the end of the shift, the value in **TOTAL DONE** reads 2500. The operator ran 25 batches of 100 during the shift (2500 / 100 = 25).

It is important to note that, at any time during batch processing, the count value in **AMOUNT DONE** can be modified to a new value by pressing the COUNTER key, positioning the black data highlight cursor over the **AMOUNT DONE** data field, and entering a new value with the number keys. This feature is useful if an error occurs during processing resulting in a “bad part”. The “bad part” can be subtracted from **AMOUNT DONE** by simply entering the correct count.

Section 5 - Processing Cables

5.1 Processing Cable Ends

To process a cable end with the settings displayed on the "Run Screen" proceed as follows:

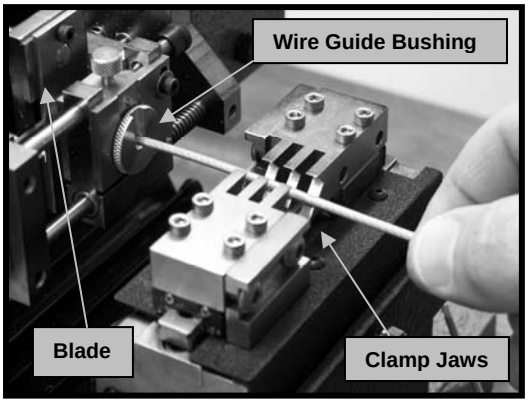

Figure 5-1

1) Insert cable end to be stripped through the *Clamp Jaws* and through the *Wire Guide Bushing* until the cable stops against the *Blade.* See Figure 5-1. **Note: Safety guard removed for clarity – unit will not process cables with safety guard removed**.
2) Press and release the Run/Stop switch located on the lower left front of the machine.
3) The CX-2000 *Clamp Jaws* will close on the cable and the unit will process the cable end according to the data displayed on the screen.
4) When the clamp jaws open, remove the cable from the machine (see Tip below.) Make sure no debris is caught in the end of the *Wire Guide Bushing*.

Note: If the *CYCLE COMPLETION MODE is* set for *AUTO*, the CX-2000 will wait for the amount of time programmed in *AUTO COMPLETION DWELL* (see Section 4.4.1- "Process Options") before completing the cycle and readying the unit for the next cycle. This will give the operator time to remove the cable before the cutter blade moves to the start position.

If *CYCLE COMPLETION MODE* is set for *MANUAL*, the clamp jaws on the CX-2000 will open, an audible beeping sound will begin and the display will prompt the operator to press the Run/Stop switch to complete the current cycle and ready the unit for the next cycle. In this mode the operator has as much time as required to clear the *Wire Guide Bushing* of debris. The blade will not close until the Run/Stop switch is pressed. This option is useful for new operators not familiar with the sequence of operation. This mode is also useful if the type of cable being processed is difficult to strip and the slugs tend to get trapped in the end of the Wire Guide Bushing.

See Section 4.4.1- "Process Options" for more information on this option and programming information.

When removing the cable from the machine after it has been stripped and the clamp opens, "push" the cable forward slightly (.050" - .100") before pulling it out of the guide bushing. This helps to ensure that the end of the guide bushing is clear before pressing Run/Stop to finish the cycle.

Do not insert any object, other than the cable to be stripped, into the *Wire Guide Bushing*. The cutting edge of the cutter blade is fragile and easily damaged. It is imperative that the cutting edge of the blade be free from chips for proper operation and precise strip quality.

If a slug portion gets caught in the end of the wire guide bushing, DO NOT ATTEMPT TO FORCE IT THROUGH. DAMAGE TO THE BLADE WILL OCCUR! ! To clear the debris, press and release the Run/Stop switch to start a cycle (with no wire in unit.) After the cycle starts, press Run/Stop again. The unit will go into "Stop Mode" and the blade will open to its maximum diameter. Insert a piece of cable into the wire guide and push the debris through. After the wire guide bushing is clear, press ENTER . The unit will re-calibrate and be ready to run. See Section 5.3 for more information.

5.2 Stopping a Strip Cycle

1) If it is necessary to stop the machine during a strip cycle, press and release the Run/Stop switch to enter "Stop Mode". The unit will stop, the cutter blade will open to its maximum diameter, and an audible alert will sound. The "Stop Screen" (see Figure 5-2) will be displayed indicating that the cycle has been stopped and that the cable should be removed.
2) Remove the cable and verify that there is no debris caught in the blade end of the *Wire Guide Bushing*.
3) If there is debris caught in the end of the *Wire Guide Bushing*, remove it by pushing a piece of cable through the *Wire Guide Bushing* before pressing ENTER. See Section 5.3 for more information on clearing debris from the *Wire Guide Bushing.*

Note **Do not insert any object, other than the cable to be stripped, into the *Wire Guide Bushing*. The cutting edge of the cutter blade is fragile and easily damaged. It is imperative that the cutting edge of the blade be free from chips for proper operation and precise strip quality.**

4) When the *Wire Guide Bushing* is clear of debris, press ENTER
5) The unit will enter "Auto Calibration Mode" and prepare for a new strip cycle.

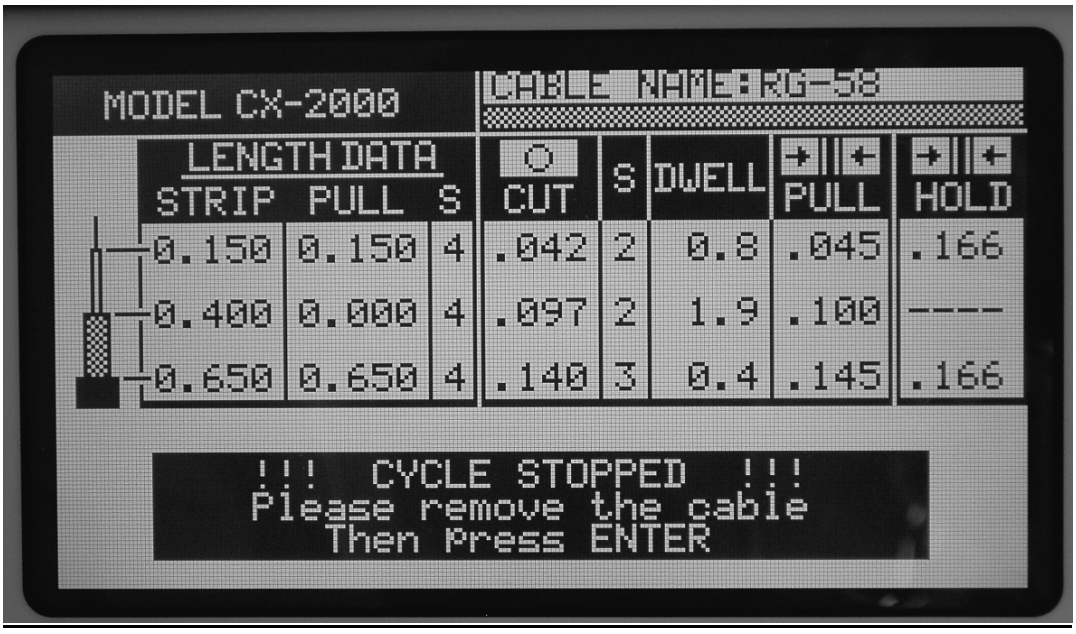

Figure 5-2 CX-2000 "Stop Screen"

5.3 Clearing Debris From the Wire Guide Bushing

Occasionally, a slug of insulation will get trapped in the end of the *Wire Guide Bushing* at the completion of a cycle. This slug should be removed before attempting to process another cable, since it will affect the strip length of the next cable by not allowing the end of the cable to touch the blade. **NEVER ATTEMPT TO FORCE TRAPPED SLUGS THROUGH THE BLADE**. Use the following method to remove trapped debris:

1) Without a cable inserted into the machine, press and release the Run/Stop switch.
2) After the clamp jaws close and the blade starts orbiting, press and release the Run/Stop switch again.
3) The unit will enter “Stop Mode”. In this mode the blade is in its maximum diameter position.
4) While the unit is in “Stop Mode”, insert a piece of cable into the *Wire Guide Bushing* and push the trapped slug through the end of the guide bushing, into the debris tray.
5) After the trapped slug has been pushed out of the guide bushing, remove the cable from the *Wire Guide Bushing*.
6) Press ENTER.
7) The unit will enter “Auto Calibration Mode” and prepare for a new strip cycle.
8) The CX-2000 is ready to continue processing cables.

5.4 Notes on Processing Cables :

- The CX-2000 will not process cables without the safety guard installed.
- Insert cable all the way through the *Wire Guide Bushing* until it stops against the blade.
- Make sure no slugs get trapped in the end of the *Wire Guide Bushing* at the end of the cycle.
- Never insert an object (other than a cable to be stripped) into the *Wire Guide Bushing*.
- Never force a trapped slug through the *Wire Guide Bushing.*
- To stop a strip cycle, press and release the Run/Stop switch.

Section 6 - Warranty and Service Policy

6.1 Limited Warranty

Orbital Technologies, Inc. manufactures its products to be free from defects in materials and workmanship. Should any defect occur within 1 year after shipment, Orbital Technologies, Inc. will, at its option, exchange or repair the defective device.

Repairs or adjustments to equipment under warranty can be performed at our facility or at the customer location, at the option of Orbital Technologies, Inc. In most cases a 1 – 2 day turn around time will be required to repair equipment at our facility. When equipment is returned to our facility for repair or replacement, freight charges will be borne by the customer. Repaired or replaced equipment will be returned at Orbital's expense via **U.P.S. Ground Service**. If an alternate shipping method is requested by the customer, the return shipping charges will be at the customers expense.

This is a limited warranty and is in lieu of all other representations and expressed and implied warranties, including the implied warranties of merchantability and fitness for use. Under no circumstances shall Orbital Technologies, Inc. be liable for any incidental or consequential property damages or losses subsequent to misuse or improper maintenance of this equipment.

Items not covered by this warranty include but are not limited to:

- Consumable parts (cutter blades, gripper blades, brush seals, etc.)
- Cosmetic problems (nicks, scratches, chipped paint etc.)
- Damage caused by any repairs or modifications by unauthorized personnel
- Abuse
- Damage caused by shipping
- Damage caused by environmental and/or atmospheric conditions

This warranty covers the following machine:

Model # :_____

Serial # : _____

Ship Date :_____

6.2 How to obtain service

Should it become necessary to return a product to Orbital Technologies, Inc. for service, it will be necessary to telephone our factory at (315)-673-4761 to obtain a Returned Goods Authorization number before shipping the product. Please be prepared to tell our representative the Model Number and Serial Number of the product being returned, a description of the problem and the telephone number of who to contact at your facility in reference to this service request.

Follow the instructions in Section 2.2 Shipping the Unit. It is strongly suggested that the original shipping materials be retained for use in the event that the product should need to be shipped back to the factory or to another location.

When shipping the product for service or repair, please be sure to include a written description of the problem or the service required, for our technician. Ship the product to:

Orbital Technologies, Inc.
Attn: RMA#_____
3368 Pleasant Valley Road
Syracuse, NY 13215